

physicians AND computers

THE PHYSICIAN'S LEADING COMPUTER

JOURNAL ■ VOL. 10 NO. 4 AUGUST 1992

TECHNOLOGY BRINGS ETHICAL QUESTIONS

■ **CARD AIDS ECG
MANAGEMENT**

■ **COMPUTERIZE
YOUR PRACTICE NOW**

Medical Decision Making

- Chief Complaint
- Patient Demographic
- Symptoms
- Review of Systems
- Lab Tests & Findings
- Medications
- Differential Diagnosis

BULK RATE
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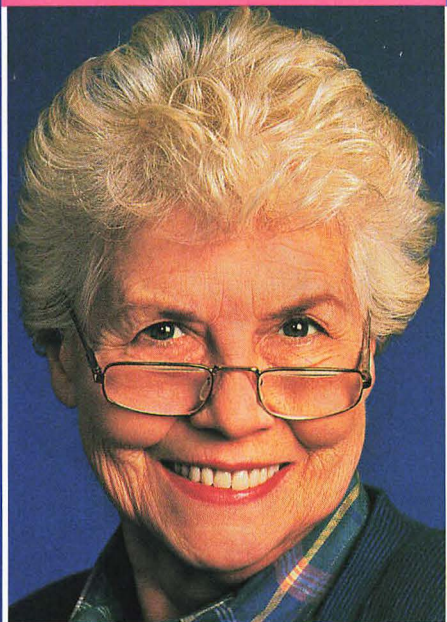
THE MEASURED

In hypertension,

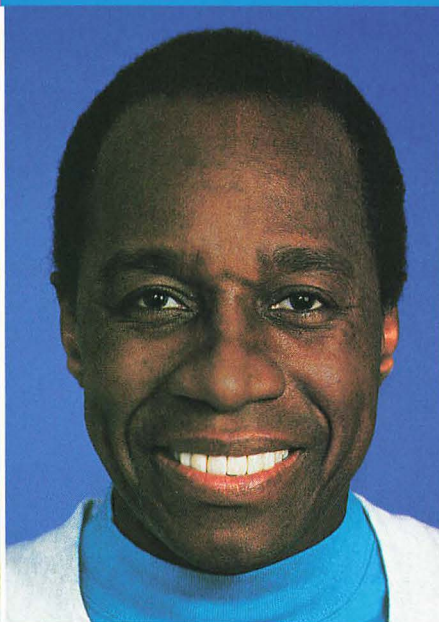
HANDLE THEIR PRESSURE, WHATEVER THE LEVEL...

- PROCARDIA XL® (nifedipine) lowers elevated blood pressure (BP), whether baseline elevations are mild to moderate,¹ or severe²
- Whatever the level of baseline elevation, you can depend on an appropriate, 24-hour measured response³

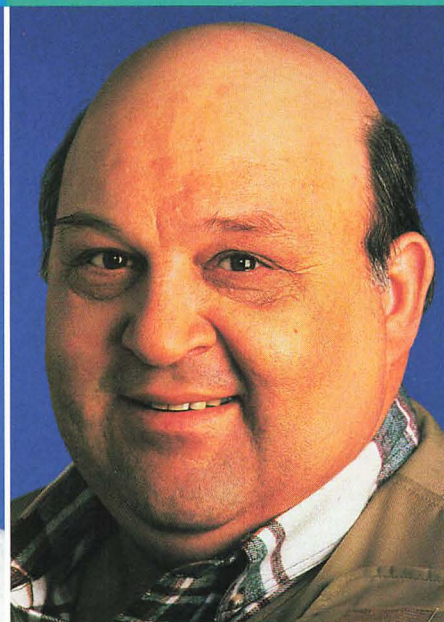
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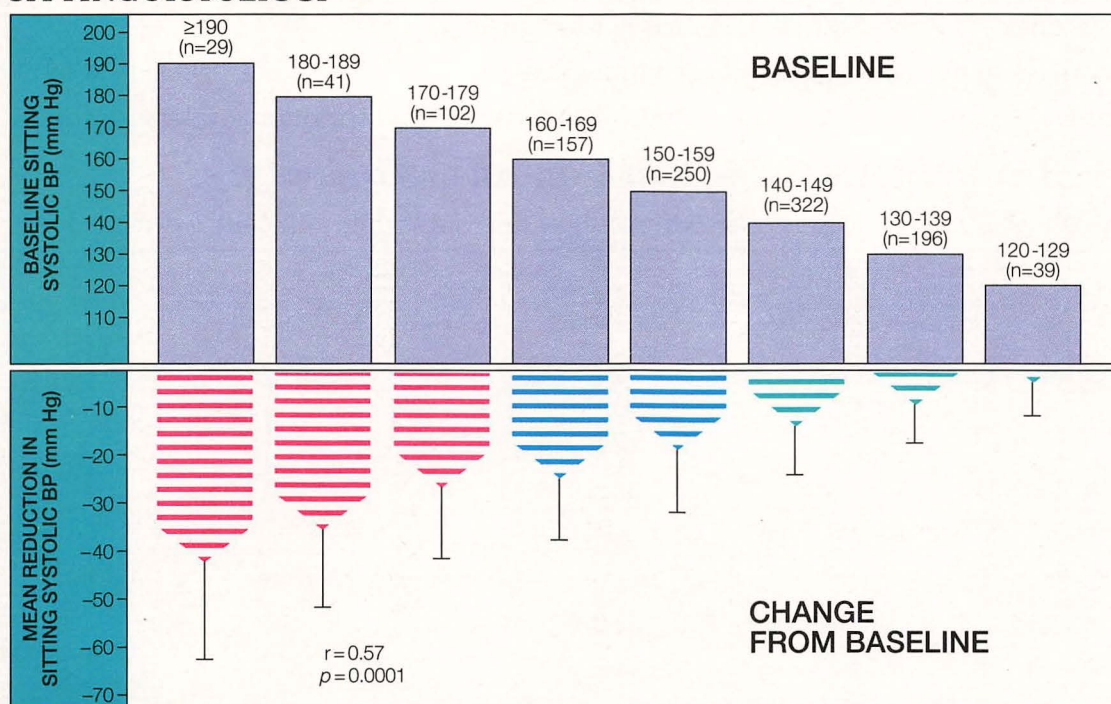
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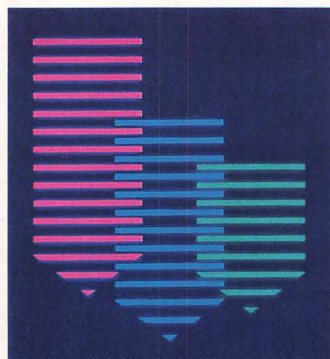
RESPONSE

WITH BLOOD PRESSURE REDUCTIONS THAT CORRELATE WITH BASELINE ELEVATIONS³

SITTING SYSTOLIC BP



Multicenter, open-label study of the efficacy and safety of PROCARDIA XL included 1155 patients with mild to moderate hypertension (sitting diastolic BP between 95 and 110 mm Hg). After a 2-wk placebo period, PROCARDIA XL was started at 30 mg qd and titrated to a maximum dose of 180 mg qd over 1-6 wk to achieve goal BP (sitting diastolic BP <90 mm Hg and a ≥10 mm Hg reduction from baseline); 1136 patients were evaluated at their final visit for changes in systolic BP. One 30-mg-qd adjustment of PROCARDIA XL was permitted during the 12-wk efficacy phase. All BP measurements were made 24 h after the last drug dose. Mean dose at final visit: 83±47 mg qd. (Data on file.³)



Once-a-Day
Procardia XL[®]
(nifedipine) Extended Release
Tablets 30 mg, 60 mg and 90 mg GITS

Handles their pressure, whatever the level

Please see brief summary of prescribing information on adjacent page.

The Measured Response of Once-a-Day **PROCARDIA XL**[®] (nifedipine) Extended Release Tablets 30 mg, 60 mg and 90 mg GITS

HANDLES THEIR PRESSURE, WHATEVER THE LEVEL

Whatever Their Baseline Elevations, Start Your Hypertensive Patients on Convenient, Once-a-Day PROCARDIA XL

- Start patients on a single 30-mg or 60-mg PROCARDIA XL Extended Release Tablet, swallowed whole, once a day, and titrate as clinically warranted
- In hypertension, doses above 120 mg are not recommended
- Side effects include peripheral edema, which is not associated with fluid retention, and headache

PROCARDIA XL Also Provides 24-Hour Control of Angina⁴

- In angina, doses above 90 mg should be used with caution and only when clinically warranted

References: 1. Krakoff LR, Bravo EL, Tuck ML, Friedman CP, the Modern Approach to the Treatment of Hypertension (MATH) Study Group. Nifedipine gastrointestinal therapeutic system in the treatment of hypertension: results of a multicenter trial. *Am J Hypertens.* 1990;3:3185-3255. 2. Phillips RA, Ardeljan M, Shimabukuro S, et al. Normalization of left ventricular structure, hemodynamics and neurohormones after one year of calcium entry blocker therapy for severe hypertension. *J Am Coll Cardiol.* February 1990;15(suppl):212A. 3. Data on file. Pfizer Inc, New York, NY. 4. Bittar N. Usefulness of nifedipine for myocardial ischemia and the nifedipine gastrointestinal therapeutic system. *Am J Cardiol.* 1989;64:31F-34F.

Brief Summary PROCARDIA XL[®] (nifedipine) Extended Release Tablets

For Oral Use

CONTRAINDICATIONS:

Known hypersensitivity reaction to nifedipine.
WARNINGS: Excessive hypotension. Although in most angina patients the hypotensive effect of nifedipine is modest and well tolerated, occasional patients have had excessive and poorly tolerated hypotension. These responses have usually occurred during initial titration or at the time of subsequent upward dosage adjustment, and may be more likely in patients on concomitant beta blockers.

Severe hypotension and/or increased fluid volume requirements have been reported in patients receiving nifedipine together with a beta-blocking agent who underwent coronary artery bypass surgery using high dose fentanyl anesthesia. The interaction with high dose fentanyl appears to be due to the combination of nifedipine and a beta blocker, but the possibility that it may occur with nifedipine alone, with low doses of fentanyl, in other surgical procedures, or with other narcotic analgesics cannot be ruled out. In nifedipine-treated patients where surgery using high dose fentanyl anesthesia is contemplated, the physician should be aware of these potential problems and if the patient's condition permits, sufficient time (at least 36 hours) should be allowed for nifedipine to be washed out of the body prior to surgery.

The following information should be taken into account in those patients who are being treated for hypertension as well as angina:

Increased Angina and/or Myocardial Infarction: Rarely, patients, particularly those who have severe obstructive coronary artery disease, have developed well documented increased frequency, duration and/or severity of angina or acute myocardial infarction on starting nifedipine or at the time of dosage increase. The mechanism of this effect is not established.

Beta Blocker Withdrawal: It is important to taper beta blockers if possible, rather than stopping them abruptly before beginning nifedipine. Patients recently withdrawn from beta blockers may develop a withdrawal syndrome with increased angina, probably related to increased sensitivity to catecholamines. Initiation of nifedipine treatment will not prevent this occurrence and on occasion has been reported to increase it.

Congestive Heart Failure: Rarely, patients usually receiving a beta blocker, have developed heart failure after beginning nifedipine. Patients with tight aortic stenosis may be at greater risk for such an event, as the unloading effect of nifedipine would be expected to be of less benefit to those patients, owing to their fixed impedance to flow across the aortic valve.

PRECAUTIONS: General—Hypotension: Because nifedipine decreases peripheral vascular resistance, careful monitoring of blood pressure during the initial administration and titration of nifedipine is suggested. Close observation is especially recommended for patients already taking medications that are known to lower blood pressure. (See WARNINGS.)

Peripheral Edema: Mild to moderate peripheral edema occurs in a dose dependent manner with an incidence ranging from approximately 10% to about 30% at the highest dose studied (180 mg). It is a localized phenomenon thought to be associated with vasodilation of dependent arterioles and small blood vessels and not due to left ventricular dysfunction or generalized fluid retention. With patients whose angina or hypertension is complicated by congestive heart failure, care should be taken to differentiate this peripheral edema from the effects of increasing left ventricular dysfunction.

Other: As with any other non-deformable material, caution should be used when administering PROCARDIA XL in patients with preexisting severe gastrointestinal narrowing (pathologic or iatrogenic). There have been rare reports of obstructive symptoms in patients with known strictures in association with the ingestion of PROCARDIA XL.

Laboratory Tests: Rare, usually transient, but occasionally significant elevations of enzymes such as alkaline phosphatase, CPK, LDH, SGOT, and SGPT have been noted. The relationship to nifedipine therapy is uncertain in most cases, but probable in some. These laboratory abnormalities have rarely been associated with clinical symptoms; however, cholestasis with or without jaundice has been reported. A small (5.4%) increase in mean alkaline phosphatase was noted in patients treated with PROCARDIA XL. This was an isolated finding not associated with clinical symptoms and it rarely resulted in values which fell outside the normal range. Rare instances of allergic hepatitis have been reported. In controlled studies, PROCARDIA XL did not adversely affect serum uric acid, glucose, or cholesterol. Serum potassium was unchanged in patients receiving PROCARDIA XL in the absence of concomitant diuretic therapy, and slightly decreased in patients receiving concomitant diuretics.

Nifedipine, like other calcium channel blockers, decreases platelet aggregation *in vitro*. Limited clinical studies have demonstrated a moderate but statistically significant decrease in platelet aggregation and increase in bleeding time in some nifedipine patients. This is thought to be a function of inhibition of calcium transport across the platelet membrane. No clinical significance for these findings has been demonstrated.

Positive direct Coombs test without hemolytic anemia has been reported but a causal relationship between nifedipine administration and positivity of this laboratory test, including hemolysis, could not be determined.

Although nifedipine has been used safely in patients with renal dysfunction and has been reported to exert a beneficial effect in certain cases, rare reversible elevations in BUN and serum creatinine have been reported in patients with pre-existing chronic renal insufficiency. The relationship to nifedipine therapy is uncertain in most cases but probable in some.

Drug Interactions—Beta-adrenergic blocking agents: (See WARNINGS) Experience in over 1400 patients with Procordia capsules in a noncomparative clinical trial has shown that concomitant administration of nifedipine and beta-blocking agents is usually well tolerated but there have been occasional literature reports suggesting that the combination may increase the likelihood of congestive heart failure, severe hypotension, or exacerbation of angina.

Long Acting Nitrates: Nifedipine may be safely co-administered with nitrates, but there have been no controlled studies to evaluate the antihypertensive effectiveness of this combination.

Digitalis: Administration of nifedipine with digoxin increased digoxin levels in nine of twelve normal volunteers. The average increase was 45%. Another investigator found no increase in digoxin levels in thirteen patients with coronary artery disease. In an uncontrolled study of over two hundred patients with congestive heart failure during which digoxin blood levels were not measured, digitalis toxicity was not observed. Since there have been isolated reports of patients with elevated digoxin levels, it is recommended that digoxin levels be monitored when initiating, adjusting, and discontinuing nifedipine to avoid possible over- or under-digitalization.

Coumarin Anticoagulants: There have been rare reports of increased prothrombin time in patients taking coumarin anticoagulants to whom nifedipine was administered. However, the relationship to nifedipine therapy is uncertain.

Cimetidine: A study in six healthy volunteers has shown a significant increase in peak nifedipine plasma levels (80%) and area-under-the-curve (74%), after a one week course of cimetidine at 1000 mg per day and nifedipine at 40 mg per day. Ranitidine produced smaller, non-significant increases. The effect may be mediated by the known inhibition of cimetidine on hepatic cytochrome P-450, the enzyme system probably responsible for the first-pass metabolism of nifedipine. If nifedipine therapy is initiated in a patient currently receiving cimetidine, cautious titration is advised.

Carcinogenesis, Mutagenesis, Impairment of Fertility: Nifedipine was administered orally to rats, for two years and was not shown to be carcinogenic. When given to rats prior to mating, nifedipine caused reduced fertility at a dose approximately 30 times the maximum recommended human dose. *In vivo* mutagenicity studies were negative.

Pregnancy: Pregnancy Category C. Nifedipine has been shown to be teratogenic in rats when given in doses 30 times the maximum recommended human dose. Nifedipine was embryotoxic (increased fetal resorptions, decreased fetal weight, increased stunted forms, increased fetal deaths, decreased neonatal survival) in rats, mice, and rabbits at doses of from 3 to 10 times the maximum recommended human dose. In pregnant monkeys, doses 2/3 and twice the maximum recommended human dose resulted in small placentas and underdeveloped chorionic villi. In rats, doses three times maximum human dose and higher caused prolongation of pregnancy. There are no adequate and well controlled studies in pregnant women. PROCARDIA XL[®] (nifedipine) Extended Release Tablets should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

ADVERSE EXPERIENCES: Over 1000 patients from both controlled and open trials with PROCARDIA XL Extended Release Tablets in hypertension and angina were included in the evaluation of adverse experiences. All side effects reported during PROCARDIA XL Extended Release Tablet therapy were tabulated independent of their causal relation to medication. The most common side effect reported with PROCARDIA XL was edema which was dose related and ranged in frequency from approximately 10% to about 30% at the highest dose studied (180 mg). Other common adverse experiences reported in placebo-controlled trials include: headache (15.8%, compared to 9.8% placebo incidence), fatigue (5.9%, compared to 4.1% placebo incidence), dizziness (4.1%, compared to 4.5% placebo incidence), constipation (3.3%, compared to 2.3% placebo incidence), and nausea (3.3%, compared to 1.9% placebo incidence). Of these, only edema and headache were more common in PROCARDIA XL patients than placebo patients.

The following adverse reactions occurred with an incidence of less than 3.0%. With the exception of leg cramps, the incidence of these side effects was similar to that of placebo alone: *body as a whole/systemic:* asthenia, flushing, pain; *cardiovascular:* palpitations; *central nervous system:* insomnia, nervousness, paresthesia, somnolence; *dermatologic:* pruritus, rash; *gastrointestinal:* abdominal pain, diarrhea, dry mouth, dyspepsia, flatulence, muscular/skeletal: arthralgia, leg cramps; *respiratory:* chest pain (non-specific), dyspnea; *urogenital:* impotence, polyuria.

Other adverse reactions were reported sporadically with an incidence of 1.0% or less. These include: *body as a whole/systemic:* face edema, fever, hot flashes, malaise, periorbital edema, rigors; *cardiovascular:* arrhythmia, hypotension, increased angina, tachycardia, syncope; *central nervous system:* anxiety, ataxia, decreased libido, depression, hyperreflexia, hyposthesia, migraine, parosmia, tremor, vertigo; *dermatologic:* alopecia, increased sweating, urticaria, purpura; *gastrointestinal:* eructation, gastrophageal reflux, gum hyperplasia, melena, vomiting, weight increase; *musculoskeletal:* back pain, gout, myalgias; *respiratory:* coughing, epistaxis, upper respiratory tract infection, respiratory disorder, sinusitis; *special senses:* abnormal lacrimation, abnormal vision, taste perversion, tinnitus; *urogenital/reproductive:* breast pain, dysuria, hematuria, nocturia.

Adverse experiences which occurred in less than 1 in 1000 patients cannot be distinguished from concurrent disease states or medications.

The following adverse experiences, reported in less than 1% of patients, occurred under conditions (e.g., open trials, marketing experience) where a causal relationship is uncertain: gastrointestinal irritation, gastrointestinal bleeding.

In multiple-dose U.S. and foreign controlled studies with nifedipine capsules in which adverse reactions were reported spontaneously, adverse effects were frequent but generally not serious and rarely required discontinuation of therapy or dosage adjustment. Most were expected consequences of the vasodilator effects of Procordia. Adverse experiences reported in placebo-controlled trials include: dizziness, lightheadedness, and giddiness (27%, compared to 15% placebo incidence); flushing, heat sensation (25%, compared to 8% placebo incidence); headache (23%, compared to 20% placebo incidence); weakness (12%, compared to 10% placebo incidence); nausea, heartburn (11%, compared to 8% placebo incidence); muscle cramps, tremor (8%, compared to 3% placebo incidence); peripheral edema (7%, compared to 1% placebo incidence); nervousness, mood changes (7%, compared to 4% placebo incidence); palpitation (7%, compared to 5% placebo incidence); dyspnea, cough, and wheezing (6%, compared to 3% placebo incidence); and nasal congestion, sore throat (6%, compared to 8% placebo incidence).

There is also a large uncontrolled experience in over 2100 patients in the United States. Most of the patients had vasospastic or resistant angina pectoris, and about half had concomitant treatment with beta-adrenergic blocking agents. The relatively common adverse events were similar in nature to those seen with PROCARDIA XL.

In addition, more serious adverse events were observed, not readily distinguishable from the natural history of the disease in these patients. It remains possible, however, that some or many of these events were drug related. Myocardial infarction occurred in about 4% of patients and congestive heart failure or pulmonary edema in about 2%. Ventricular arrhythmias or conduction disturbances each occurred in fewer than 0.5% of patients.

In a subgroup of over 1000 patients receiving Procordia with concomitant beta blocker therapy, the pattern and incidence of adverse experiences was not different from that of the entire group of Procordia treated patients (See PRECAUTIONS).

In a subgroup of approximately 250 patients with a diagnosis of congestive heart failure as well as angina, dizziness or lightheadedness, peripheral edema, headache or flushing each occurred in one in eight patients. Hypotension occurred in about one in 20 patients. Syncope occurred in approximately one patient in 250. Myocardial infarction or symptoms of congestive heart failure each occurred in about one patient in 15. Atrial or ventricular dysrhythmias each occurred in about one patient in 150.

In post-marketing experience, there have been rare reports of exfoliative dermatitis caused by nifedipine.

More detailed professional information available on request.

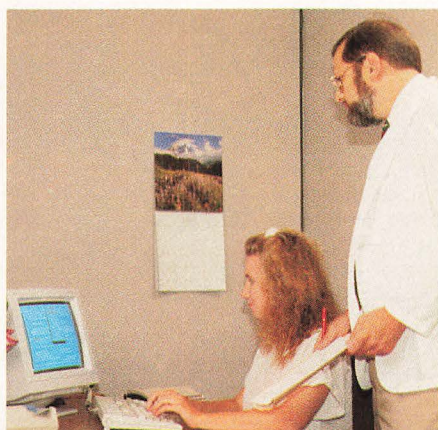
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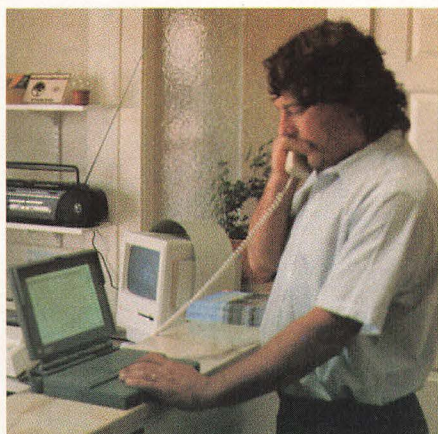
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BYTES & PIECES

Software for Emergency Room Physicians

New federally mandated requirements for Medicare billings and reimbursement are compelling physicians to sharpen their medical reporting skills, and nowhere is this more apparent than in hospital emergency departments.

Lanier Worldwide Inc. has introduced a software upgrade that enables EMstation to handle new CPT-4 billing procedure codes. This software lets physicians create complete reports that satisfy Levels IV and V documentation requirements.

Uniformly accurate reports decrease physician liability and improve patient care, because



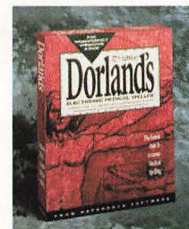
Software lets ER physicians handle new CPT-4 codes.

software reminds physicians of procedures.

Using voice, mouse or keyboard commands, physicians select patients, according to various fields presented on the monitor. Components of EMstation include a workstation and a hard disk. Lanier Inquiry Service, (800) 648-6432.

Electronic Medical Speller Offered

Reference Software International has begun shipping Dorland's Electronic Medical Speller, a very comprehensive medical speller. It combines WordPerfect's spell-checking dictionary with medical terms from two reference works, *Dorland's Illustrated Medical Dictionary* and *Dorland's Medical Speller*.



The program integrates more than 140,000 medical terms into a standard dictionary, and covers 58 medical and scientific specialties.

It is ideal for physicians who compose letters directly, as well as for medical staff who transcribe medical records. Dorland's works with both WordPerfect for DOS versions 5.0 and 5.1, and WordPerfect 5.1 for Windows. The speller requires a PC-compatible and hard drive with 600K of free space. Reference Software International, (415) 541-0222.

Electronic Records with ClinicaLogic

ClinicaLogic is an electronic medical records program that physicians can link to other medical data bases. Developed specifically for physicians by a physician, the program combines ease of use with functionality. It allows physicians to retrieve clinical medical records in seconds, better manage clinical data for the entire practice, and access patient charts from remote locations.

The program has an easy-to-learn menu operation and full-screen editing. Physicians can immediately access a capsule summary of a patient's clinical status (i.e., diagnoses, medications, allergies), laboratory reports and progress notes. MedicalLogic Inc., (503) 232-2781.

Hayes Offers New Fax Modem

Optima 144+ FAX 144, a data-plus-fax modem, comes with Hayes Smartcom fax communications software. The new modem lets users send documents directly from their computer as well as receive fax messages and then view, rotate, flip, print or save to disk.

Free technical assistance is available online, and the modem automatically negotiates with other modems and fax machines.

The software also keeps detailed



The new Hayes modem is also a fax.

transaction logs in files on disk so that both send and receive fax activities may be viewed at any time. Hayes Microcomputer Products Inc., (404) 840-9200.

In mild to moderate bacterial infections*

PINPOINTS.¹⁻⁴
PENETRATES.^{1,3-5}
PREVAILS.¹

**Full-course antibiotic therapy
with just 5 once-daily doses**

NEW

ONCE DAILY FOR 5 DAYS

ZithromaxTM
(AZITHROMYCIN) 250-mg capsules

* Due to susceptible strains of indicated organisms.
©1992, Pfizer Inc

Please see adjacent page for brief summary of prescribing information.

PINPOINTS. PENETRATES. PREVAILS.

NEW

ONCE DAILY FOR 5 DAYS ZithromaxTM (AZITHROMYCIN) 250-mg capsules

Rx

*Zithromax 250 mg.
#6
Sig: ii po x 1 day, stat
+ po daily x 4*

Take 1 hour before or 2 hours after a meal

- **For respiratory infections such as acute bacterial exacerbations of COPD (chronic bronchitis) and uncomplicated skin infections:**

500-mg single dose on day 1; 250 mg once daily on days 2 through 5. Total dose is 1.5 g.

- **Zithromax should be given either 1 hour before or 2 hours after a meal.**

- **A favorable safety profile** with a low (0.7%; n=4949) discontinuation rate due to side effects. In multidose trials, the most common side effects were diarrhea/loose stools (5%), nausea (3%), and abdominal pain (3%).¹



References: 1. Data on file, Pfizer Inc, New York, NY. 2. Baldwin DR, Wise R, Andrews JM, Ashby JP, Honeybourne D. Azithromycin concentrations at the sites of pulmonary infection. *Eur Respir J*. 1990;3:886-890. 3. Girard AE, Cimochowski CR, Faiella JA. Correlation of increased azithromycin levels with phagocyte infiltration into sites of infection. [Abstract 762]. Thirtieth Interscience Conference on Antimicrobial Agents and Chemotherapy, 1990. 4. Retsema J, Bergeron J, Girard D, Wilens W, Schekly W, Girard A. Preferential

concentration of azithromycin in infected mouse thighs as compared to contralateral non-infected thighs. [Abstract A-63]. 91st General Meeting of the American Society for Microbiology, 1991. 5. Gladue RP, Bright GM, Isaacson RE, Newborg MF. In vitro and in vivo uptake of azithromycin (CP-62,993) by phagocytic cells: possible mechanism of delivery and release at sites of infection. *Antimicrob Agents Chemother*. 1989;33:277-282.

ZITHROMAXTM (azithromycin) CAPSULES BRIEF SUMMARY INDICATIONS AND USAGE

ZITHROMAXTM (azithromycin) is indicated for the treatment of individuals 16 years of age and older with mild to moderate infections (pneumonia; see WARNINGS) caused by susceptible strains of the designated microorganisms in the specific conditions listed below:

Lower Respiratory Tract

Acute bacterial exacerbations of chronic obstructive pulmonary disease due to *Haemophilus influenzae*, *Moraxella catarrhalis*, or *Streptococcus pneumoniae*.

Community-acquired pneumonia of mild severity due to *Streptococcus pneumoniae* or *Haemophilus influenzae* in patients appropriate for outpatient oral therapy.

Note: Azithromycin should not be used in patients with pneumonia who are judged to be inappropriate for outpatient oral therapy because of moderate to severe illness or risk factors such as any of the following:
patients with nosocomially acquired infections,
patients with known or suspected bacteremia,
patients requiring hospitalization,
elderly or debilitated patients, or
patients with significant underlying health problems that may compromise their ability to respond to their illness (including immunodeficiency or functional asplenia).

Upper Respiratory Tract

Streptococcal pharyngitis/tonsillitis—As an alternative to first line therapy of acute pharyngitis/tonsillitis due to *Streptococcus pyogenes* occurring in individuals who cannot use first line therapy.

Note: Penicillin is the usual drug of choice in the treatment of *Streptococcus pyogenes* infections and the prophylaxis of rheumatic fever. ZITHROMAXTM is often effective in the eradication of susceptible strains of *Streptococcus pyogenes* from the nasopharynx. Because some strains are resistant to ZITHROMAXTM, susceptibility tests should be performed when patients are treated with ZITHROMAXTM. Data establishing efficacy of azithromycin in subsequent prevention of rheumatic fever are not available.

Skin and Skin Structure

Uncomplicated skin and skin structure infections due to *Staphylococcus aureus*, *Streptococcus pyogenes*, or *Streptococcus agalactiae*. Abscesses usually require surgical drainage.

Sexually Transmitted Diseases

Non-gonococcal urethritis and cervicitis due to *Chlamydia trachomatis*.

ZITHROMAXTM, at the recommended dose, should not be relied upon to treat gonorrhea or syphilis. Antimicrobial agents used in high doses for short periods of time to treat non-gonococcal urethritis may mask or delay the symptoms of incubating gonorrhea or syphilis. All patients with sexually-transmitted urethritis or cervicitis should have a serologic test for syphilis and appropriate cultures for gonorrhea performed at the time of diagnosis. Appropriate antimicrobial therapy and follow-up tests for these diseases should be initiated if infection is confirmed.

Appropriate culture and susceptibility tests should be performed before treatment to determine the causative organism and its susceptibility to azithromycin. Therapy with ZITHROMAXTM may be initiated before results of these tests are known; once the results become available, antimicrobial therapy should be adjusted accordingly.

CONTRAINDICATIONS

ZITHROMAXTM is contraindicated in patients with known hypersensitivity to azithromycin, erythromycin, or any macrolide antibiotic.

WARNINGS

In the treatment of pneumonia, azithromycin has only been shown to be safe and effective in the treatment of community-acquired pneumonia of mild severity due to *Streptococcus pneumoniae* or *Haemophilus influenzae* in patients appropriate for outpatient oral therapy. Azithromycin should not be used in patients with pneumonia who are judged to be inappropriate for outpatient oral therapy because of moderate to severe illness or risk factors such as any of the following:

patients with nosocomially acquired infections,
patients with known or suspected bacteremia,
patients requiring hospitalization,
elderly or debilitated patients, or
patients with significant underlying health problems that may compromise their ability to respond to their illness (including immunodeficiency or functional asplenia).

Pseudomembranous colitis has been reported with nearly all antibacterial agents and may range in severity from mild to life-threatening. Therefore, it is important to consider this diagnosis in patients who present with diarrhea subsequent to the administration of antibacterial agents.

Treatment with antibacterial agents alters the normal flora of the colon and may permit overgrowth of clostridia. Studies indicate that a toxin produced by *Clostridium difficile* is a primary cause of "antibiotic-associated colitis."

After the diagnosis of pseudomembranous colitis has been established, therapeutic measures should be initiated. Mild cases of pseudomembranous colitis usually respond to discontinuation of the drug alone. In moderate to severe cases, consideration should be given to management with fluids and electrolytes, protein supplementation, and treatment with an antibacterial drug effective against *Clostridium difficile*.

PRECAUTIONS

General: Because azithromycin is principally eliminated via the liver, caution should be exercised when azithromycin is administered to patients with impaired hepatic function. There are no data regarding azithromycin usage in patients with renal impairment; thus caution should be exercised when prescribing azithromycin in these patients.

The following adverse event has not been reported in clinical trials with azithromycin, an azalide. However, it has been reported with macrolide products: ventricular arrhythmias, including ventricular tachycardia and torsades de pointes, in individuals with prolonged QT intervals.

Information for Patients: Patients should be cautioned to take this medication at least one hour prior to a meal or at least two hours after a meal. This medication should not be taken with food.

Patients should also be cautioned not to take aluminum- and magnesium-containing antacids and azithromycin simultaneously.

Drug Interactions: Aluminum- and magnesium-containing antacids reduce the peak serum levels (rate) but not the AUC (extent) of azithromycin absorption.

Administration of cimetidine (800 mg) two hours prior to azithromycin had no effect on azithromycin absorption.

Azithromycin did not affect the plasma levels or pharmacokinetics of theophylline administered as a single intravenous dose. The effect of azithromycin on the plasma levels or pharmacokinetics of theophylline administered in multiple doses resulting in therapeutic steady state levels of theophylline is not known. However, concurrent use of macrolides and theophylline has been associated with increases in the serum concentrations of theophylline. Therefore, until further data are available, prudent medical practice dictates careful monitoring of plasma theophylline levels in patients receiving azithromycin and theophylline concomitantly.

Azithromycin did not affect the prothrombin time response to a single dose of warfarin. However, prudent medical practice dictates careful monitoring of prothrombin time in all patients treated with azithromycin and warfarin concomitantly. Concurrent use of macrolides and warfarin in clinical practice has been associated with increased anticoagulant effects.

The following drug interactions have not been reported in clinical trials with azithromycin; however, no specific drug interaction studies have been performed to evaluate potential drug-drug interaction. Nonetheless, they have been observed with macrolide products. Until further data are developed regarding drug interactions when azithromycin and these drugs are used concomitantly, careful monitoring of patients is advised.

Digoxin—elevated digoxin levels.

Ergotamine or dihydroergotamine—acute ergot toxicity characterized by severe peripheral vasospasm and dysesthesia.

Triazolam—decrease the clearance of triazolam and thus may increase the pharmacologic effect of triazolam.

Drugs metabolized by the cytochrome P₄₅₀ system—elevations of serum carbamazepine, cyclosporine, hexobarbital, and phenytoin levels.

Laboratory Test Interactions: There are no reported laboratory test interactions.

Carcinogenesis, Mutagenesis, Impairment of Fertility: Long-term studies in animals have not been performed to evaluate carcinogenic potential. Azithromycin has shown no mutagenic potential in standard laboratory tests: mouse lymphoma assay, human lymphocyte clastogenic assay, and mouse bone marrow clastogenic assay.

Pregnancy: Teratogenic Effects. Pregnancy Category B. Reproduction studies have been performed in rats and mice at doses up to moderately maternally toxic dose levels (i.e., 200 mg/kg/day). These doses, based on a mg/m² basis, are estimated to be 4 and 2 times, respectively, the human daily dose of 500 mg. No evidence of impaired fertility or harm to the fetus due to azithromycin was found. There are, however, no adequate and well-controlled studies in pregnant women. Because animal reproduction studies are not always predictive of human response, azithromycin should be used during pregnancy only if clearly needed.

Nursing Mothers: It is not known whether azithromycin is excreted in human milk. Because many drugs are excreted in human milk, caution should be exercised when azithromycin is administered to a nursing woman.

Pediatric Use: Safety and effectiveness in children or adolescents under 16 years of age have not been established.

Geriatric Use: Pharmacokinetic parameters in older volunteers (65-85 years old) were similar to those in younger volunteers (18-40 years old) for the 5-day therapeutic regimen. Dosage adjustment does not appear to be necessary for older patients with normal renal and hepatic function receiving treatment with this dosage regimen.

ADVERSE REACTIONS

In clinical trials most of the reported side effects were mild to moderate in severity and were reversible upon discontinuation of the drug. Approximately 0.7% of the patients from the multiple dose clinical trials discontinued ZITHROMAXTM (azithromycin) therapy because of treatment-related side effects. Most of the side effects leading to discontinuation were related to the gastrointestinal tract, e.g., nausea, vomiting, diarrhea, or abdominal pain. Rare, but potentially serious side effects, were angioedema (1 case) and cholestatic jaundice (1 case).

Clinical:

Multiple-dose regimen: Overall, the most common side effects in patients receiving the multiple-dose regimen of ZITHROMAXTM were related to the gastrointestinal system with diarrhea/loose stools (5%), nausea (3%), and abdominal pain (3%) being the most frequently reported.

No other side effects occurred in patients on the multiple-dose regimen of ZITHROMAXTM with a frequency greater than 1%. Side effects that occurred with a frequency of 1% or less included the following:

Cardiovascular: Palpitations, chest pain.

Gastrointestinal: Dyspepsia, flatulence, vomiting, melena, and cholestatic jaundice.

Genitourinary: Monilia, vaginitis, and nephritis.

Nervous System: Dizziness, headache, vertigo, and somnolence.

General: Fatigue.

Allergic: Rash, photosensitivity, and angioedema.

Single 1-gram dose regimen: Overall, the most common side effects in patients receiving a single-dose regimen of 1 gram of ZITHROMAXTM were related to the gastrointestinal system and were more frequently reported than in patients receiving the multiple-dose regimen.

Side effects that occurred in patients on the single one-gram dosing regimen of ZITHROMAXTM with a frequency of 1% or greater included diarrhea/loose stools (7%), nausea (5%), vomiting (2%), and vaginitis (2%).

Laboratory Abnormalities: Significant abnormalities (irrespective of drug relationship) occurring during the clinical trials were reported as follows:

With an incidence of 1-2%: elevated serum creatine phosphokinase, potassium, ALT (SGPT), GGT, and AST (SGOT).

With an incidence of less than 1%: leukopenia, neutropenia, decreased platelet count, elevated serum alkaline phosphatase, bilirubin, BUN, creatinine, blood glucose, LDH, and phosphate.

When follow-up was provided, changes in laboratory tests appeared to be reversible.

In multiple-dose clinical trials involving more than 3000 patients, 3 patients discontinued therapy because of treatment-related liver enzyme abnormalities and 1 because of a renal function abnormality.

DOSAGE AND ADMINISTRATION (See INDICATIONS AND USAGE)

ZITHROMAXTM (azithromycin) should be given at least 1 hour before or 2 hours after a meal.

The recommended dose of ZITHROMAXTM for the treatment of individuals 16 years of age and older with mild to moderate acute bacterial exacerbations of chronic obstructive pulmonary disease, pneumonia, pharyngitis/tonsillitis (as second-line therapy), and uncomplicated skin and skin structure infections due to the indicated organisms is: 500 mg as a single dose on the first day followed by 250 mg once daily on days 2 through 5 for a total dose of 1.5 grams of ZITHROMAXTM.

The recommended dose of ZITHROMAXTM for the treatment of non-gonococcal urethritis and cervicitis due to *C. trachomatis* is a single 1 gram (1000 mg) dose of ZITHROMAXTM.

More detailed professional information available on request.

Issued February 1992



Pfizer Labs

New Book Release

The Physician-Computer Connection, by William F. Bria II, M.D., and Richard L. Rydell, shows hospital administrators and information systems professionals how to enlist physicians in the selection, design and implementation of patient care information systems, and how to break down the barriers that often discourage physicians from using these systems. The authors present innovative methods to maximize computer usage. Catalog F12-093192 can be ordered from American Hospital Information Systems Inc., P.O. Box 92683, Chicago, Ill. 60675-2683; \$37.50, plus \$7.95 shipping/handling. American Hospital Publishing, (312) 440-6800.

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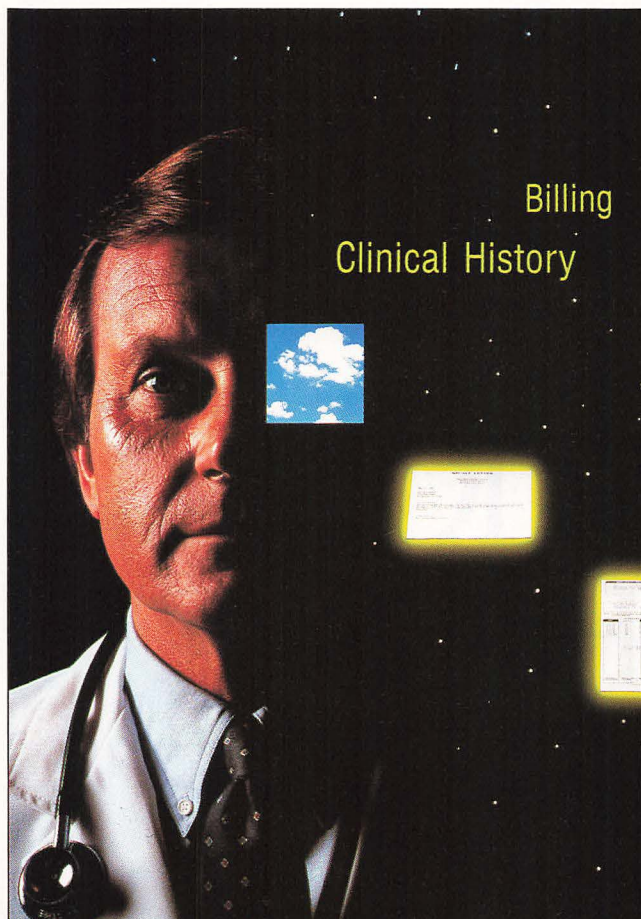
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OVERVIEW



A QUESTION OF ETHICS

The increased capability of computational diagnosis brings with it a host of questions.

Every new medical technology arrives on wards and in clinics with an ensemble of ethical issues and problems. The new devices might be very expensive, in which case we wonder if the money could do more good elsewhere. They might keep us alive longer than we want, in which case we wonder why we use them at all. Or they might make diagnoses and recommend treatments, in which case we wonder what it is to practice medicine in the first place.

Some computational medical tools have shown extraordinary ability to process clinical information, weigh it against a data base and issue a diagnosis. In some instances, computers in apparently rigorous studies have rendered more accurate diagnoses than the control group—physicians.

This kind of success, coupled with relentless advances in computer science and artificial intelligence, suggests that the future of medicine will include a wider use of computational diagnostics; as a result, medicine will confront a new ensemble of ethical questions.

Genesis of the Debate

The debate over those questions can be traced to 1985, when three University of Pittsburgh scholars (a physician who specializes in medical informatics, a philosopher-physician and a lawyer-ethicist) investigated the scope and limits of clinical computer use (see reference 1). While some questions had been raised in the early 1970s, the Pittsburgh synthesis helped lay the groundwork for future discussions; and several points discussed below were raised or addressed in that key essay.

The first question that arises with any new medical technology is this: Does it improve patient care? If the answer is negative or unknown, it

would be inappropriate to use the technology. The problem with diagnostic expert systems is that we have yet to produce rigorous evaluation and validation procedures. As a result, we often are ignorant about how well a computer program works compared to human decision makers or to other programs. So in many if not all cases we are unsure about any potential benefit to patients.

This problem is not unique to medical computing. Researchers in a variety of fields, from machine translation to computer-aided design, are trying to determine how best to evaluate their inventions. One obvious tack is to design rigorous experiments to make the crucial comparisons. While this is done occasionally for medical programs (see reference 2), it is comparatively rare. Further, the field is new enough so that it is not entirely clear what "rigorous" amounts to. Is it sufficient to compare programs to human diagnosticians, or must they also be compared to a "gold standard" like autopsies? Must retrospective studies be supplemented by prospective ones?

Equally important are internal conceptual and technical considerations that make it difficult to compare different systems to each other. Diagnostic expert systems rely on knowledge bases that must be created and maintained. But the best way to represent medical (or any other) knowledge is a scientific question that remains open to dispute. Indeed, the knowledge-representation problem is one of the most important and interesting in all of contemporary science. Crucially, then: How do different knowledge representation schemas differ? Likewise for software: How do different programs compare? In what ways are artificial intelligence approaches inferior or superior to statistical approaches?

What this amounts to is that we have no good protocol for compar-

ing different diagnostic programs to each other. But surely such comparisons are vital if we are contemplating the use of any one of them in a clinical setting.

Given that the evaluation problem is itself a topic of controversy and research, it is generally premature to conclude that widespread use of diagnostic expert systems could improve patient care. The ethical upshot is that we therefore ought not yet rely on computers to render diagnoses. Put differently and more broadly, the lesson that emerges is that we ought to go slowly in applying new and comparatively untested technologies. The lesson might seem obvious, but the zeal with which we embrace computational devices suggests that we might not have learned the lesson well.

Question of Intellectual Property

A related ethical problem has to do with intellectual property. Is medical knowledge, either of facts or skills, something that can be owned, its use and distribution limited? To answer "yes" is to suggest, among other things, that medical computer programs and data bases contain proprietary information that must be kept secret from competitors.

But this line has been said to undercut one of the oldest and deepest principles of medical practice, namely, that one who has medical knowledge has a corresponding duty to share it with colleagues or apply it for patients. (Imagine a surgeon who develops a new lifesaving technique, and refuses to describe it to colleagues for fear they will use it!) Too much secrecy also makes it difficult if not impossible for other researchers to make the sorts of comparisons discussed just above. The idea here is that entrepreneurial secrecy and scientific replication are incompatible stances.

Contrarily, one of the lessons we have learned from the intellectual property debate in other fields is that some property rights (patents and



The tension between these two poles—knowledge entails responsibility vs. developers should be rewarded—is likely to shape the growing debate over diagnostic expert systems.

copyrights) can serve to provide quality control. This argument has been made in terms of other medical devices and pharmaceuticals, but the question has yet to be studied in terms of diagnostic tools. Also, property rights help guarantee financial rewards or “just desserts” for those who make the effort and have the skills to develop new tools.

The tension between these two poles—knowledge entails responsibility vs. developers should be rewarded—is likely to shape the growing debate over diagnostic expert systems. So far and fortunately, several commercially available diagnostic systems are inexpensive, and this defuses standard criticisms against medical profiteering.

But suppose we have arrived at a comprehensive evaluation metric and agreed on the proprietary status of these systems. The question now is, Who should use the programs?

Use by Non-Physicians

The trend toward medical decentralization (witness the rise of physicians’ assistants, nurse practitioners and home testing) suggests that pressure will increase to make diagnostic expert systems broadly available.

Well, why not? Why shouldn’t non-physicians have access to diagnosis machines? One obvious and intuitive answer is that they will not have enough knowledge to know what data to enter or how to interpret the results. Diagnostic expert systems require as input a set of symptom descriptions, among other things. But can a non-physician detect or elicit the salient symptoms? Indeed, detection and elicitation of signs and symptoms on a physical exam is traditionally a physician-only task. It is not clear we want to delegate this process too far along the health care hierarchy. And it would be wildly inappropriate to allow anyone other than a physician to perform certain kinds of physical examinations.

Exceptions might however be made in cases where no physician is available. It has been suggested that intelligent machines would be better than nothing in remote or rural areas, on battlefields and in space.

Compare in this regard a specialist in one field who uses a diagnostic program to evaluate clinical evidence from another (a cardiologist uses a system for nephrology, say). Now the concern is that the physician would be less able to recognize

a computational (diagnostic) error than if it were in his or her own field. Physicians are generally a confident lot, and most people tend to give high regard to computer output. The combination is potentially dangerous.

This leads to a complementary problem. How can we be certain that a physician knows how to work the computer? While it has many faults, we do have a system for evaluating the medical competence of physicians. But there is no corresponding system for evaluating computer skills. Diagnostic expert systems require at least some understanding of the data base and other software, and it is just a mistake to suppose that a physician could operate one without a minimum of experience. The problem is that we do not know how much experience is enough.

Similarly, some third-party payers have shown preliminary interest in using computer programs to evaluate human diagnoses and perhaps detect fraud. While physicians are aghast at the prospect of being second-guessed this way, non-physicians’ interests are also at stake if intelligent machines are put to this use.

In principle, diagnostic expert systems are more accessible to physicians than medicine is to garden-variety computer users. But given that many physicians have a strong aversion to computers for far more mundane tasks, it is not obvious how confident we should be about their using diagnostic programs. (It has been observed that the computer revolution has bypassed many professional men who, because they believed it was beneath them, never learned to type!)

Low-Risk Uses—And Their Risks

The discussion so far has assumed that intelligent machines might eventually be used to substitute for human judgment. A more modest use is suggested by developers of commercially available systems. The

generation of differential diagnoses for consideration, study or teaching is a valuable and low-risk use of diagnostic expert systems. A system that included a literature searching facility, a dictionary look-up device and a component that listed common treatment options would be a valuable conceptual and educational tool.

But there is no bright line between "medical tool" and "artificial medicine." Because expert systems are constantly being improved, we can imagine the day when a physician will be counted blameworthy because he or she has failed to use an intelligent machine for diagnostic assistance. In other words, while we can imagine comparatively benign uses for a physician's workstation, it might develop that pressures will increase to use the machine more extensively. If the standard of care changes in this way, the physician who fails to use a machine diagnostician will arguably be offering substandard care.

To use or rely on machines too soon is to risk offering substandard care; to use them too late has the same risk. And—here is the clincher—we do not know when "too soon" ends and "too late" begins.

The ethical problem is deep, and it goes to the very heart of what it is to practice medicine and what we value in at least one traditional model of the doctor-patient relationship. It is this: The best patient care might entail less physician—less human—care. In other words, artificial medicine might improve outcomes for sick people, but at the potential price of further dehumanizing both the patient and the physician.

We already practice health care by volume and in many cases anonymously. Nowadays, physicians in busy practices do not remember their patients' names, or know about their jobs or families. This is true even as we boast of technical advances that have in many respects

improved health care. Computational medicine offers a new twist to this trend. The kind of tool at issue does not improve auscultation, does not render more accurate chemical analyses, does not give us better images or antibiotics. It is a tool to assist human cognition, the most human attribute of all.

The dilemma can be resolved, not by scorning or abandoning these new tools, but by using them only with the greatest respect and caution. We must bear in mind that diagnostic expert systems are indeed tools and not—at least yet—surrogates. To use them as human proxy machines would constitute the gravest kind of misuse. As with other medical devices, the consequences of improperly used computer programs can be very serious indeed. Perhaps especially, practitioners must not allow computers to add to the already great distance between them and their patients.

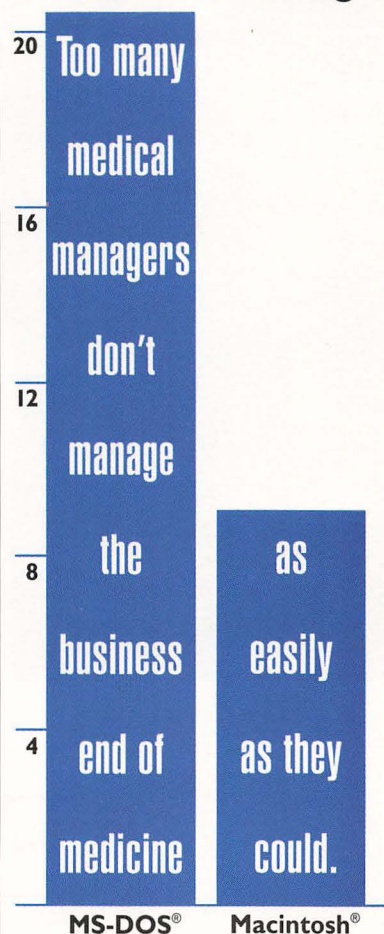
There is good news in all of this. It is that discussions about the ethics of computers in medicine have paralleled the development of the technology itself. We are looking over our shoulders even as we design new and extraordinary intelligent machines. This will prevent us from having to play ethical catch-up come the day when our clinical machines consistently give us a run for the money. ■

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Hours for Training*



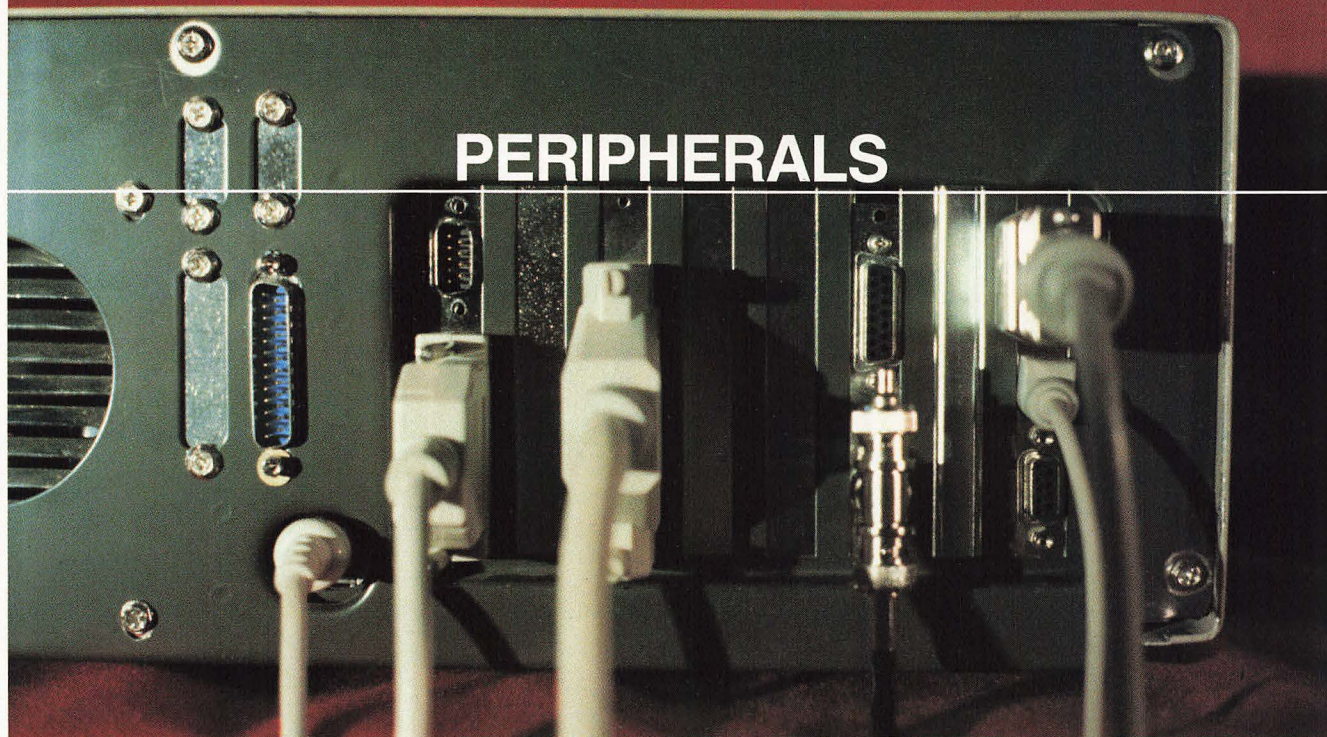
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ECGs IN A PAPERLESS OFFICE

Innovative, card-based system offers efficient, low-cost option for tracking electrocardiograms.

BY ABDULLA M. ABDULLA,
F.A.C.P., F.A.C.C.

Every physician who has to interpret an electrocardiogram (ECG) and arrive at a disposition in a clinic, office, hospital or emergency room knows the importance of having an old tracing for purposes of com-

parison. This improves patient care and may be vital for medicolegal purposes.

It is true that old ECGs can be obtained from the hospital and office charts, if available. Unfortunately, old tracings are often unavailable when an office patient arrives in an emergency room of a hospital for the first time, or when a patient is discharged from the hospital and

is subsequently seen in the office for the first time.

Additionally, not having an old ECG for comparison is a common frustration while interpreting tracings in the ECG reading room of most hospitals. The latter problem is created by the sheer volume handled by these departments and the lack of space to store all the tracings within their physical confines. Conse-

quently, the patient's medical record chart is the only place where an old ECG can be found: a remote and practically inaccessible site while one is busy interpreting a stack of ECGs.

A paperless ECG management system is an obvious solution to this problem and has been offered by several companies. However, the systems are usually expensive (in the \$100,000 range) and often require the maintenance and management of minicomputers.

The QRS Card ECG system from Micro Med, Inc. is an innovative, cost-effective and user-friendly method that employs a personal computer and printer. The system, a FDA (Food and Drug Administration) 510K listed device, is a complete ECG management system with the facilities of real-time ECG monitoring, data viewing, ECG storage, retrieval and transmission from a comprehensive data base system. Also, it has the ability to obtain printed copies with the use of a variety of devices such as laser, inkjet, and dot matrix printers. A fax machine also can be used to obtain a printout for comparison purposes.

The system consists of a computer card that utilizes microcomputer-based technology and is one of the most inexpensive systems on the market. The half-size, 8-bit board plugs into one of the expansion slots of an IBM-compatible personal computer, and may also be used with laptop and transportable computers that can accommodate an industry standard plug-in board. With this card, the PC can be converted to a highly advanced ECG storage, retrieval, transmission, viewing and printing system. The QRS-Card system is supplied with a connector box, patient cables, electrode patches, an isolation transformer and an instruction manual. The card has connectors for the patient cable and a real-time chart recorder.

The patient cable is an interface between the card and the patient leads. It senses and conditions the

signal before sending it to the card. The isolation transformer is connected between the main power and the computer (plus the printer and other devices that are connected to the computer). This is necessary to minimize or prevent any current leakage from the PC chassis and other devices. The transformer provides connection power sockets for up to four devices.

The QRS Card system comes with easy-to-use menu-driven software. It is a breeze to install and easy to use. Within 60 minutes of unpacking the card and diskettes, I was comfortably using the system. With a single keystroke, a physician can acquire 12 ECG leads in real time (Figure 1), as well as view, store, print and transmit the ECG data. The system offers the flexibility of viewing and storing different user-selectable formats. Thus, the physician can display all 12 leads simultaneously, or view selected lead(s), such as single, three or six leads. The user can define what leads he or she wishes to display in these formats.

Additionally, there is a Zoom Window that allows a closer analysis of a particular portion of the ECG. There is also a choice of standard (25 mm/sec) and fast (50 mm/sec) speed. One can toggle (switch) between the two speeds while viewing the tracing. The operator can define the select gains of 5, 10 (full-standard), 20 or 40 mm/mV. There is also an option of turning a 50/60 Hz filter on or off depending upon the signal noise. A physician notepad feature is provided to incorporate comments for reference, or an interpretation of the tracing. With the use of a mouse or the cursor keypad, the operator can also define areas for measurements (PR, QRS, QT, R-R, etc). These measurements can be stored in the data base (Figure 2). The company that manufactures and distributes the QRS Card is also in the process of obtaining FDA approval for automated measurement of the usual intervals.

Menu Screen

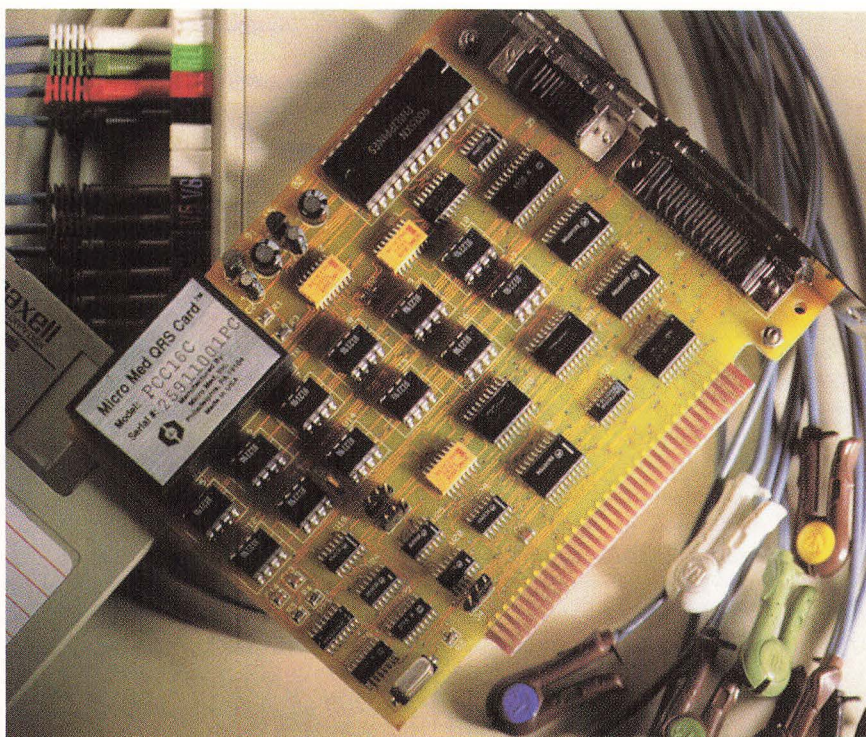
The QRS Card menu screen is divided into three areas. The bottom row offers single keystroke selection of menu items such as Help, Start or Stop ECG, Lead selection, Speed change, Gain change, Print, Save, Retrieve ECG, Window display of selected segment, and Utilities such as backup, restore and setup. The vertical column on the right side of the screen offers measurement options, sub-menu selections and other indicators. The remainder of the screen is for display of the ECG tracing.

The screen display mode can be used in the Monitor mode to show a real time ECG, or in the Retrieve mode to view a stored tracing. The system keeps the last 12 seconds of the real-time data in memory. This can be saved with the patient demographic data in a data base.

Other functions available to the user include the use of the "ESC" key to go back to the previous step in the program, the "F" key to turn the 50/60Hz filter on and off, and the "C" key to toggle the optional chart recorder on and off. Double keystrokes ("Alt" and one of the letter keys) are used to perform the following functions: delete patient record, update or change patient information, Physician Notepad, Lead selection that is user defined, ECG measurements and saving, printing options, setup/default, view setup and view patient information. Optional modules also allow the following: transmit ECG over telephone, receive ECG over telephone, send ECG on a fax machine, and office management (billing and scheduling).

Printing of ECG

Printing of an ECG tracing can be achieved by using a variety of devices such as a laser, inkjet, and dot matrix printers. With the fax module, a regular fax machine can also be used as a printer when an ECG is needed for comparison purposes. This option is particularly useful in a networked



Micro Med's QRS Card can be plugged into an IBM-compatible computer.

system, or if a physician communicates remotely with his office computer (from the emergency room, at night, with the use of a laptop computer and modem).

The printer can be used to print a real-time, retrieved or a magnified tracing (window). The latter option can only be used after the tracing is stored and then retrieved. When using regular printing paper, the system prints the ECG signal with a grid of the large ECG boxes. Thus, 40 msec or the small ECG boxes are not provided for measurement purposes. However, this can be easily solved by obtaining special paper, containing a printed grid of the small and large boxes, from Micro Med and other sources. When printing on the grid paper the computer-generated grid must be turned off.

Telecommunication

A telecommunication module is supplied as a part of the QRS card sys-

tem package. This module uses a standard modem (Hayes-compatible, connected to a serial port) to exchange information between two systems equipped with QRS Cards. Single ECGs or batches of tracings can be transmitted by highlighting the required ECG and using the user-friendly menu options. Complete information about a patient is transmitted, including demographic data, notepad comments, measurements, etc. At the receiving end, additional measurements of the transmitted ECG can be performed, if needed. Also, comments can be added to the notepad.

The new ECG (obtained in the emergency room, etc) then can be sent back to the original system, or to any other computer using the QRS Card. Thus, the telecommunication ability allows one to be able to access ECG for purposes of comparison in a truly paperless and efficient manner.

Fax Modules

Conventionally, the copy made by a receiving fax machine is usually fuzzy since the original copy has to first go through the scanner of the transmitting machine. Micro Med supplies a special fax machine at a reasonable price. This machine has a direct computer interface built in and can also be used as a regular fax machine, local printer and a scanner for the computer.

With the QRS Card software, the system acts like an interface between the computer and the telephone line for transmitting and receiving faxed ECGs. The transmitting person selects an ECG and enters the telephone number of the receiving fax machine from the keyboard. The software extracts the required ECG from the data base, converts it into a form that is suitable for faxing, and then transmits it via the fax machine supplied by Micro Med.

The operator has the option of switching the grid on or off, so that the ECG may be received on a plain or on a special gridded paper, respectively.

Other Features

The **office management system** facilitates management of an office practice. The module provides a complete practice management software featuring scheduling, billing, accounting, data base of patient information and insurance companies, etc. The system allows the user to define customized formats for generating various reports, print-outs, billing sheets and insurance forms. Different procedures and insurance information can also be defined by using keywords.

The **chart recorder** is a printing device for obtaining a hard copy of a selected lead in real time. It is a 2-inch thermal chart recorder that is connected to the QRS-Card. The chart recorder can be turned on and off from within the main menu, and can be used to print at 25 and 50 mm/sec.

Technical Information

The sampling rate is 250 and 1000 Hz and the analog to digital (A/D) resolution is 13 bits. The A/D rate is 10 KHz. The frequency response is 0.05-100 Hz, upper 3db at 100 Hz (AAMI and AHA Std.). The system requirements are an IBM compatible PC (personal computer) or laptop with a 286 or higher processor, one 8-bit slot, at least 640K RAM, 10 or more megabyte hard disk, VGA or ECG monitor (LCD, EL or monochrome monitors can also be used), and a laser or dot matrix printer. Optional items include a Hayes compatible modem hooked to the serial port, chart recorder and fax machine.

The suggested retail price of the QRS Card System is \$3,800. However, discounts have been offered at major medical meetings. The price includes the PCC16C QRS-Card, patient cable, patient leads, isolation transformer, electrodes, QRS-Card software and one-year parts and labor warranty and free upgrades for the software and modules.

In summary, the QRS Card system is a flexible, user-friendly and cost-effective system that takes the physician one step closer to the truly paperless office and hospital. The storage of ECGs on a hard disk, optical medium, etc., means that hundreds of thousands of ECGs can be stored and retrieved from a desktop data base. More importantly, the tracings can be accessed remotely without having to use a courier. Networking, such as Novell, is also supported by the system, making access of the data base even easier.

Future promised add-ons will enhance the value of the system. These include ECG automated measurement and interpretation, Late potential/Signal averaging, Stress testing, Batch telephone transmission, Macintosh retrieval software, Voice response activation and patient bar coding.

For more information call (800) 877-1107 or contact Micro Med,

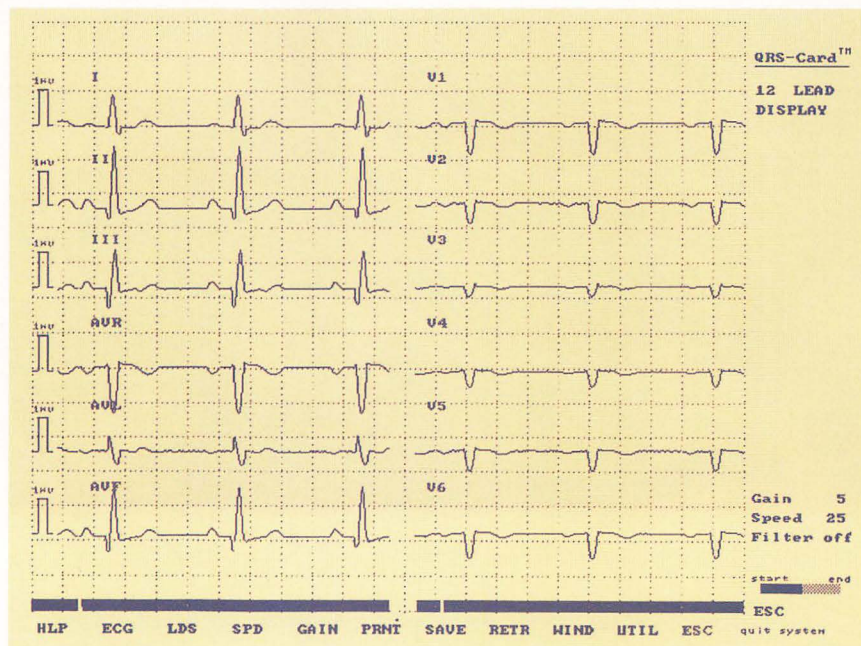


Figure 1: The QRS Card lets the physician see 12 ECG leads in real time.

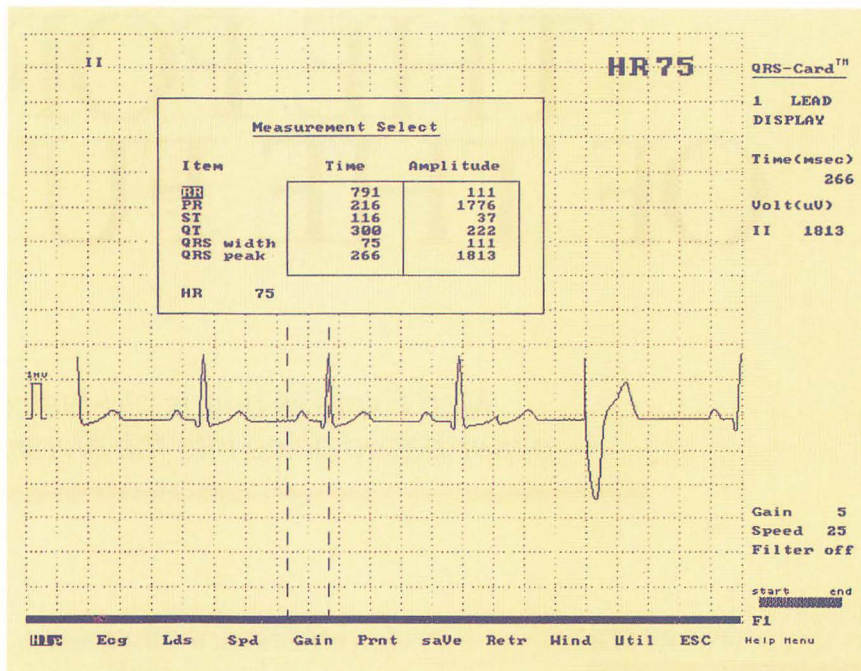
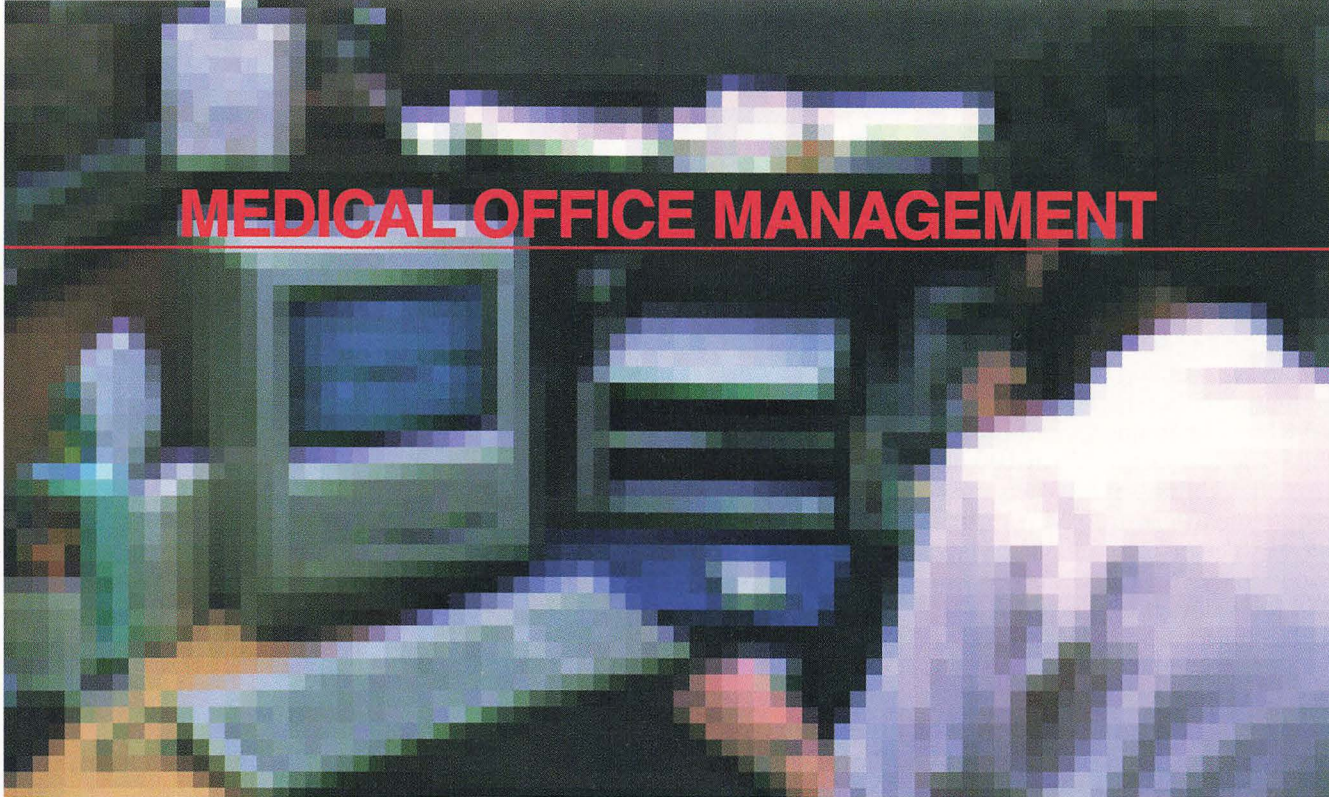


Figure 2: Measurements can be stored in the data base for future reference.

Inc., University City Science Center,
3508 Market St., Philadelphia, Pa.
19104.

*Dr. Abdulla is the Medical Editor of
Physicians and Computers.*



MEDICAL OFFICE MANAGEMENT

THE FORM OF THE FUTURE

*Med Express brings old-fashioned
paper-based office into the electronic age.*

BY KAY SCHWERZLER

Imagine entering an examination room with one or two sheets of paper in hand that allow you to scan quickly and easily through the history of a patient's problem. No riffling through the bowels of a

chart to find a test result. No searching for your last prognosis.

It's all succinct and sorted in the printed encounter form: the problem, its ICD-9 code, a tally of all tests, treatments and results pertinent to the current problem prescribed in this office and previous to this office. Also included are results of tests and

treatments prescribed at the last encounter. In addition, there's a summary of prognoses, symptoms and levels of activity starting from the first visit, as well as transcribed notes from the last appointment. And all with a minimum of dictation.

Med Express is a new medical record tracking system that replaces

conventional paper charts with an electronic form. It uses checklists for treatments, consultations and diagnostic tests to minimize dictation time. Then it tracks the information by visit and by results in the areas of disability status, work loss duration, pending tests, test results, all types and frequency of treatment including surgery, therapy, medications and more.

According to Steve Gangey, a principal in Absolutely Essential Systems of Camarillo, Calif., developer of the system, Med Express is the first of its kind in tracking medical records. "It is so thorough in tracking patient encounters, there is improved efficiency throughout the entire medical practice," he said. "It does more than merely accumulate data for storage in a data base. Med Express is designed to be dynamic, data driven and easily customized to fit the needs of the practice as defined by the physician. It is designed for increased efficiency, cost containment and provides for concurrent review."

Presently the data in the Med Express system supports orthopedic and neurologic functions. However, it can be customized to serve other medical specialties such as cardiology, obstetrics and gynecology.

The system is huge, with 39 data bases and 72 indexes. But with message lines on the top and bottom of the screen indicating options, with hot-key instant access, pull-down menus, F1 helps, F7 look-ups and F8 checklists, the system is accessible even to computer illiterates. "It's beyond user-friendly: It's intuitive," Gangey said.

Medical Record Tracking

One or two days prior to each regular workday, a staff member accesses the Reports Menu and inputs the desired date to obtain its schedule of appointments. The printer then generates the Morning Report with its list of the day's

patients and their home and work phone numbers for a reminder call, phone numbers for follow-up on overdue test results, consultations and treatment reports, as well as a list of no-shows and those patients who need rescheduling.

Next, the staff member moves the cursor to the Encounter Forms section of the Reports Menu and presses enter to batch-print customized encounter forms for each of the day's patients.

As patients arrive, the physician is prepared with each one's summarized accumulated data plus a checklist to record that day's remarks. In addition, preprinted pick-lists are available in the examination rooms specifying an array of treatment selections that includes injections, immobilizations, aspirations, medications, tests and other lists the physician might have customized for himself. At the encounter's conclusion, the doctor presents the completed forms to the data entry person, who, within minutes, can fax a preliminary treatment report to the referral source, whether it's workers compensation or another insurance carrier.

After the physician's abbreviated dictation has been transcribed into the computer via the WordPerfect system that interfaces with Med Express, the completed treatment report is presented to the doctor for approval. If corrections are required, the form flows through the loop again. If the report is correct, the encounter form and check-off sheets

At the encounter's conclusion, the doctor presents the completed forms to the data entry person, who, within minutes, can fax a preliminary treatment report to the referral source.

are discarded, the final treatment report is mailed to the carrier, and a copy placed in the patient's chart. At the patient's next appointment, the new encounter form that is generated automatically contains all the updates from the previous meeting.

A Bird's-Eye View

Dr. Lawrence N. Borelli, one of the originators of Med Express, is an orthopedic surgeon in Camarillo, Calif., an associated clinical professor of orthopedics at the University of Southern California, and a self-styled computer addict.

Borelli says he was frustrated about the time he wasted dictating and correcting notes and responding to requests by compensation carriers and other legal or insurance bodies. He detailed his needs to Gangey, a product engineer, who translated those needs to a team of programmers. After 16 months, Med Express made its debut.

Borelli has used the system in his practice for more than six months and has entered more than 2,000 patients. "It (the encounter form) gives me a bird's-eye view of the patient, then allows me eye-to-eye contact to concentrate on the person in front of me," he says. Borelli prefers not to have a computer between him and the patient, which prompted the team to develop a complete paper interface for the system.

"The program is a time-saver," Borelli says. "Organized, logical systems like this make you very fast. It

OVERWHELMING

Candida spp is one of the top ten pathogens throughout the hospital.^{1,3}

Candida albicans ghost cells.

*Results of multicenter, open-label, randomized clinical trial using Diflucan 100 mg/day for 7 days; clotrimazole 50 mg/day for 14 days. Results reflect complete resolution (clinical cure) or substantial (clinical) improvement of baseline signs and symptoms of infection and therapy for 5 days with fluconazole or 10 days with clotrimazole.

†Endoscopic cure results of a double-blind, randomized trial comparing Diflucan 100 to 200 mg/day; ketoconazole 200 to 400 mg/day. Endoscopic cure means complete resolution of esophageal lesions at end-of-cure endoscopic examination. Not all patients underwent endoscopy at initiation and completion of therapy. Patients excluded from the study included those who had leukopenia or those who were expected to develop leukopenia and patients with any other conditions known to be associated with poor ketoconazole absorption.

‡Open-label trial. Diflucan 100 to 200 mg/day. "Overall" includes cases of candidemia, disseminated candidiasis, peritonitis, urinary tract infections, and pneumonia. Results reflect complete resolution (clinical cure) or substantial (clinical) improvement of baseline signs and symptoms of infection.

§Open-label, randomized trial. Results reflect cure (CSF culture negative and either absence of disease, or disappearance or improving signs/symptoms) and quiescent (CSF culture positive, stable or improving signs/symptoms). Diflucan, 400 mg loading dose on the first day and 200 mg thereafter or amphotericin B, at least 0.3 mg/kg/day.

¶Multicenter comparative study. Results reflect successful maintenance without culture-confirmed relapse and without toxicity necessitating discontinuance as evaluated at a median of 279 days for Diflucan and 140 days for amphotericin B. Diflucan, 200 mg/day; amphotericin B, 1 mg/kg/week.

ANTIFUNGAL SUCCESS

Excellent clinical efficacy in oropharyngeal, esophageal, and systemic candidiasis, and cryptococcal meningitis

	OROPHARYNGEAL** P<0.001		ESOPHAGEAL*† (endoscopic cures) P<0.001	
MUCOSAL CANDIDIASIS	DIFLUCAN (212/221) Cured 81% Improved 15%	96%	DIFLUCAN (59/67)	88%
	clotrimazole (72/91) Cured 65% Improved 14%	79%	ketoconazole (38/69)	55%
	OVERALL*‡		URINARY TRACT*‡	
SYSTEMIC CANDIDIASIS	DIFLUCAN (189/219) Cured 63% Improved 23%	86%	DIFLUCAN (30/38) Cured 53% Improved 26%	79%
	ACUTE THERAPY*§ P = 0.39 (NS)		MAINTENANCE TO PREVENT RELAPSE*¶ P<0.001	
CRYPTOCOCCAL MENINGITIS	DIFLUCAN (78/131) Cured 34% Quiescent 26%	60%	DIFLUCAN (103/111)	93%
	amphotericin B (42/63) Cured 40% Quiescent 27%	67%	amphotericin B (52/78)	67%

Extensive penetration to key tissues, organs, and fluids

Distribution throughout the body approximates that of total body water after oral or IV dosing.⁴
Oral bioavailability of Diflucan is >90% and unaffected by agents that increase gastric pH.⁴

Excellent clinical safety

In over 4,000 patients who received Diflucan for at least 7 days, the most common adverse events were nausea 3.7%, headache 1.9%, and skin rash 1.8%.

Rare incidents of serious hepatotoxicity have been reported, but the causal relationship to Diflucan is uncertain.⁴

ONCE-A-DAY
Diflucan[®] *ORAL*
(fluconazole) *IV*
100 mg, 200 mg Tablets / 200 mg, 400 mg IV Injection

The Antifungal Effectiveness You Need. The Safety You Want.

Please see brief summary of prescribing information on last page of this advertisement.

**The Antifungal Effectiveness You Need.
The Safety You Want.**

ONCE-A-DAY **Diflucan®** ORAL **(fluconazole) IV** 100 mg, 200 mg Tablets / 200 mg, 400 mg IV Injection



WITH ONCE-DAILY DOSING FOR A WIDE RANGE OF PATIENTS

RECOMMENDED DOSAGE:

INDICATION	LOADING DOSE	DAILY THERAPY
OROPHARYNGEAL CANDIDIASIS	200 mg	100 mg
ESOPHAGEAL CANDIDIASIS	200 mg	100 mg*
SYSTEMIC CANDIDIASIS	400 mg	200 mg
CRYPTOCOCCAL MENINGITIS (acute)	400 mg	200 mg*
CRYPTOCOCCAL MENINGITIS (maintenance to prevent relapse)		200 mg

*Doses of up to 400 mg/day may be used, based on medical judgment of the patient's response to therapy.

References: 1. Horan TC, Culver D, Jarvis W, et al. Pathogens causing nosocomial infections: preliminary data from the National Nosocomial Infection Surveillance System. *The Antimicrobial Newsletter*. September 1988;5:65-67. 2. Jarvis WR. National Nosocomial Infection Surveillance System. Predominant pathogens in hospital infection. Presented at the 17th International Congress of Chemotherapy. June 23-28, 1991; Berlin, FRG. Abstract 111. 3. Emori TG, Banerjee SN, Culver DH, et al. Nosocomial infections in elderly patients in the United States, 1986-1990. *Am J Med*. 1991;91(suppl 3B):289S-293S. 4. Data available on request from Roerig. 5. Saag MS, Powderly WG, Cloud GA, et al. Comparison of amphotericin B with fluconazole in the treatment of acute AIDS-associated cryptococcal meningitis. *N Engl J Med*. 1992;326:83-89. 6. Powderly WG, Saag MS, Cloud GA, et al. A controlled trial of fluconazole or amphotericin B to prevent relapse of cryptococcal meningitis in patients with the acquired immunodeficiency syndrome. *N Engl J Med*. 1992;326:793-798.

Brief Summary

INDICATIONS AND USAGE

DIFLUCAN (fluconazole) is indicated for the treatment of:

- Oropharyngeal and esophageal candidiasis. DIFLUCAN is also effective for the treatment of serious systemic candidal infections, including urinary tract infection, peritonitis, and pneumonia.
 - Cryptococcal meningitis.
- Specimens for fungal culture and other relevant laboratory studies (serology, histopathology) should be obtained prior to therapy to isolate and identify causative organisms. Therapy may be instituted before the results of the cultures and other laboratory studies are known; however, once these results become available, anti-infective therapy should be adjusted accordingly.

CONTRAINDICATIONS

DIFLUCAN (fluconazole) is contraindicated in patients who have shown hypersensitivity to fluconazole or to any of its excipients. There is no information regarding cross hypersensitivity between fluconazole and other azole antifungal agents. Caution should be used in prescribing DIFLUCAN to patients with hypersensitivity to other azoles.

WARNINGS

In rare cases, anaphylaxis has been reported.

Patients who develop abnormal liver function tests during DIFLUCAN therapy should be monitored for the development of more severe hepatic injury. Although serious hepatic reactions have been rare and the causal association with DIFLUCAN uncertain, if clinical signs and symptoms consistent with liver disease develop that may be attributable to fluconazole, DIFLUCAN should be discontinued. (See Adverse Reactions.)

Immunocompromised patients who develop rashes during treatment with DIFLUCAN should be monitored closely and the drug discontinued if lesions progress. (See Adverse Reactions.)

PRECAUTIONS

Drug Interactions (See Clinical Pharmacology)

DIFLUCAN (fluconazole) increased the prothrombin time after warfarin administration. Careful monitoring of prothrombin time in patients receiving DIFLUCAN and coumarin-type anticoagulants is recommended.

DIFLUCAN increased the plasma concentrations of phenytoin. Careful monitoring of phenytoin concentrations in patients receiving DIFLUCAN and phenytoin is recommended.

DIFLUCAN has been infrequently associated with an increase in cyclosporine concentrations in renal transplant patients with or without impaired renal function. Careful monitoring of cyclosporine concentrations in patients receiving DIFLUCAN and cyclosporine is recommended.

DIFLUCAN increased the plasma concentrations and reduced the metabolism of tolbutamide, glyburide and glipizide. When DIFLUCAN is used concomitantly with these or other sulfonylurea oral hypoglycemic agents, blood glucose concentrations should be carefully monitored, and the dose of the sulfonylurea should be adjusted as necessary.

Rifampin enhances the metabolism of concurrently administered DIFLUCAN. Depending on clinical circumstances, consideration should be given to increasing the dose of DIFLUCAN when it is administered with rifampin.

Physicians should be aware that drug-drug interaction studies with other medications have not been conducted, but such interactions may occur.

Carcinogenesis, Mutagenesis and Impairment of Fertility

Fluconazole showed no evidence of carcinogenic potential in mice and rats treated orally for 24 months at doses of 2.5, 5 or 10 mg/kg/day (approximately 2-7x the recommended human dose). Male rats treated with 5 and 10 mg/kg/day had an increased incidence of hepatocellular adenomas.

Fluconazole, with or without metabolic activation, was negative in tests for mutagenicity in 4 strains of *S. typhimurium*, and in the mouse lymphoma L5178Y system. Cytogenetic studies *in vivo* (murine bone marrow cells, following oral administration of fluconazole) and *in vitro* (human lymphocytes exposed to fluconazole at 1000 µg/mL) showed no evidence of chromosomal mutations.

Fluconazole did not affect the fertility of male or female rats treated orally with daily doses of 5, 10 or 20 mg/kg or with parental doses of 5, 25 or 75 mg/kg, although the onset of parturition was slightly delayed at 20 mg/kg p.o. In an intravenerous perinatal study in rats at 5, 20 and 40 mg/kg, dystocia and prolongation of parturition were observed in a few dams at 20 mg/kg (approximately 5-15x the recommended human dose) and 40 mg/kg, but not at 5 mg/kg. The disturbances in parturition were reflected by a slight increase in the number of stillborn pups and decrease of neonatal survival at these dose levels. The effects on parturition in rats are consistent with the species specific estrogen-lowering property produced by high doses of fluconazole. Such a hormone change has not been observed in women treated with fluconazole. (See Clinical Pharmacology.)

Pregnancy

Teratogenic Effects. Pregnancy Category C: Fluconazole was administered orally to pregnant rabbits during organogenesis in two studies, at 5, 10 and 20 mg/kg and at 5, 25, and 75 mg/kg respectively. Maternal weight gain was impaired at all dose levels, and abortions occurred at 75 mg/kg (approximately 20-60x the recommended human dose); no adverse fetal effects were detected. In several studies in which pregnant rats were treated orally with fluconazole during organogenesis, maternal weight gain was impaired and placental weights were increased at 25 mg/kg. There were no fetal effects at 5 or 10 mg/kg; increases in fetal anatomical variants (supernumerary ribs, renal pelvis dilation) and delays in ossification were observed at 25 and 50 mg/kg and higher doses. At doses ranging from 80 mg/kg (approximately 20-60x the recommended human dose) to 320 mg/kg embryolethality in rats was increased and fetal abnormalities included wavy ribs, cleft palate and abnormal cranio-facial ossification. These effects are consistent with the inhibition of estrogen synthesis in rats and may be a result of known effects of lowered estrogen on pregnancy, organogenesis and parturition.

There are no adequate and well controlled studies in pregnant women. DIFLUCAN should be used in pregnancy only if the potential benefit justifies the possible risk to the fetus.

Nursing Mothers

Fluconazole is secreted in human milk at concentrations similar to plasma. Therefore, the use of DIFLUCAN in nursing mothers is not recommended.

Pediatric Use

Efficacy of DIFLUCAN has not been established in children. A small number of patients from age 3 to 13 years have been treated safely with DIFLUCAN using doses of 3-6 mg/kg daily.

ADVERSE REACTIONS

Sixteen percent of over 4000 patients treated with DIFLUCAN (fluconazole) in clinical trials of 7 days or more experienced adverse events. Treatment was discontinued in 1.5% of patients due to adverse clinical events and in 1.3% of patients due to laboratory test abnormalities.

In combined clinical trials and foreign marketing experience prior to U.S. marketing, patients with serious underlying disease (predominantly AIDS or malignancy) rarely have developed serious hepatic reactions or exfoliative skin disorders during treatment with DIFLUCAN (See Warnings). Two of these hepatic reactions and one exfoliative skin disorder (Stevens-Johnson syndrome) were associated with a fatal outcome. Because most of these patients were receiving multiple concomitant medications, including many known to be hepatotoxic or associated with exfoliative skin disorders, the causal association of these reactions with DIFLUCAN therapy is uncertain.

Clinical adverse events were reported more frequently in HIV infected patients (21%) than in non-HIV infected patients (13%); however, the patterns in HIV infected and non-HIV infected patients were similar. The proportions of patients discontinuing therapy due to clinical adverse events were similar in the two groups (1.5%).

The following treatment-related clinical adverse events occurred at an incidence of 1% or greater in 4048 patients receiving DIFLUCAN for 7 or more days in clinical trials: nausea 3.7%, headache 1.9%, skin rash 1.8%, vomiting 1.7%, abdominal pain 1.7%, and diarrhea 1.5%.

In two comparative trials evaluating the efficacy of DIFLUCAN for the suppression of relapse of cryptococcal meningitis, a statistically significant increase was observed in median AST (SGOT) levels from a baseline value of 30 IU/L to 41 IU/L in one trial and 34 IU/L to 66 IU/L in the other. The overall rate of serum transaminase elevations of more than 8 times the upper limit of normal was approximately 1% in fluconazole-treated patients in clinical trials. These elevations occurred in patients with severe underlying disease, predominantly AIDS or malignancies, most of whom were receiving multiple concomitant medications, including many known to be hepatotoxic. The incidence of abnormally elevated serum transaminases was greater in patients taking DIFLUCAN concomitantly with one or more of the following medications: rifampin, phenytoin, isoniazid, valproic acid or oral sulfonylurea hypoglycemic agents.

In rare cases, anaphylaxis has been reported.

Although rare cases of leukopenia and thrombocytopenia have been reported, a causal relationship to fluconazole has not been established.

also gives me tight control of my patients and makes each encounter more meaningful. Insurance companies love it because of the built-in faxing capability and the fact that it tracks for them. They don't have to look up previous treatments."

Borelli also notes that it's easy for physicians to write fuzzy reports. But not with Med Express. "I have gotten the notice of consulting physicians as well as compensation carriers for the apparent painstaking effort I have gone through to make my medical records consistent, timely and to the point. I send out hard info. I can't tell you how good that is."

Borelli also points to the tracking capabilities of Med Express. "I can see how many MRIs I'm doing," he says. "I can see my drug patterns and look up surgeries by pathology performed. I tend to be demanding in capturing lots of data. The system is dynamic and fluid as opposed to rigid. Using it's like driving a sports car versus a Cadillac—you really have control."

Another capability of the system that pleases Borelli is the fact that he can call up records by modem from a remote location to know exactly the clinical course of a patient. "On weekends it's great," he says, "because I can't remember patients on weekends."

System Capabilities

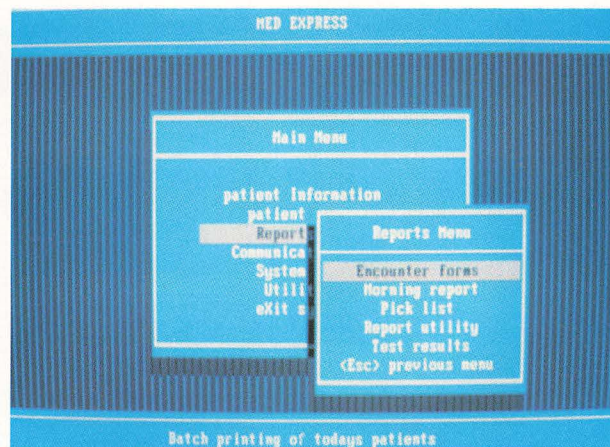
The Main Menu features six options: Patient Information, Patient Visit, Communication Menu, Reports Menu, System Menu, Utilities, plus an exit path.

Used less frequently than the others, the Utilities Menu removes deleted records and re-indexes the system's files, and the Communications Menu deals with the fax-direct and modem options of the system.

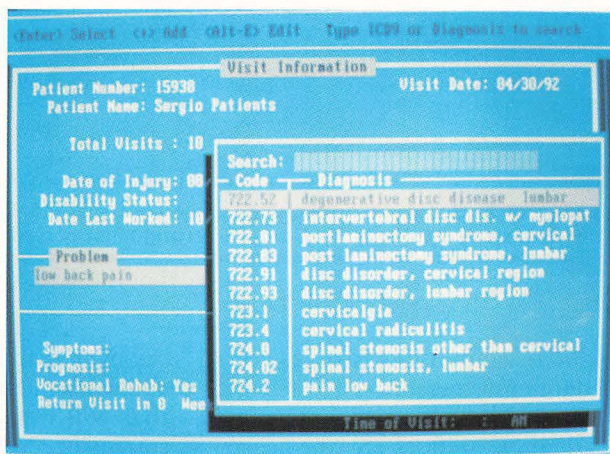
The System Menu accesses directory information: Med Express can be bundled with a modem and software packages that include R&R, PC Anywhere, HiJaak and WordPerfect. Systems also displays the complete library of look-up files available in various phases of the Patient Visit file.

Five components of the Reports Menu include the previously mentioned encounter forms and morning reports. Other forms for printout include pick-lists for treatment selection, R&R Report Writer for creating custom reports, and check-off sheets for test results.

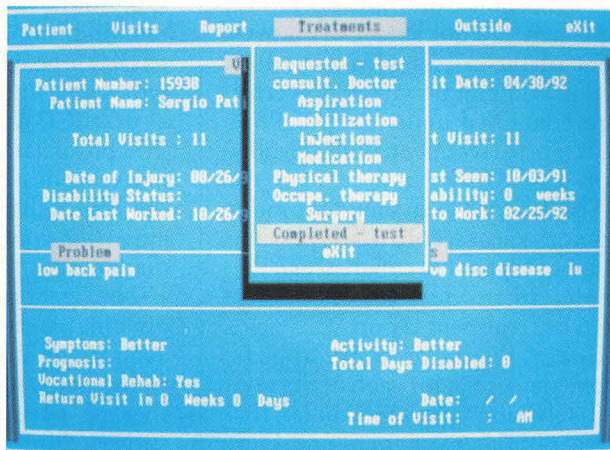
Patient Information includes space for particulars on the referral source, patient and employer. Once several carriers are entered into the system, an F7 pop-up will display the entire list. Then, if there's a match, a touch of the enter button automatically will transfer the appropriate name and address to spaces on the information form. The same with employers: There's an F7 look-up that displays the employer list. A search with the cursor or an entry of the first few letters of the company will focus the desired name, if entered previously, and a touch of the enter key will fill in the blanks on the form. With such helps throughout the system, the developers have



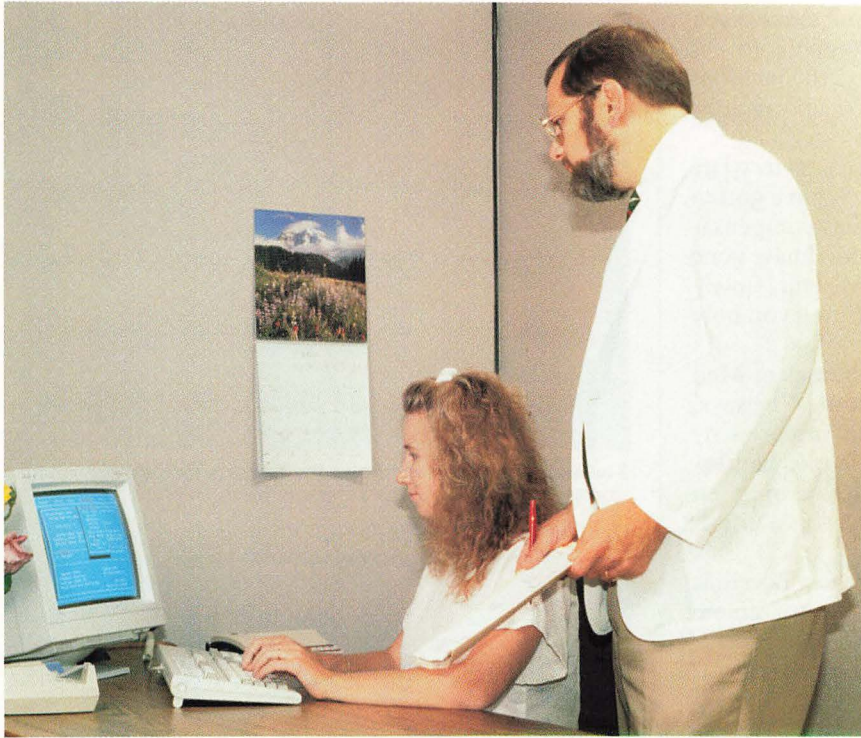
The Main Menu screen shows the Reports Module accessed.



The Med Express scroll window shows ICD-9 diagnosis codes.



The screen shows test results to five levels of specificity.



Dr. Lawrence N. Borelli, an orthopedic surgeon in Camarillo, Calif., and a staff person confer on the day's patients. Dr. Borelli is an originator of Med Express.

sought to simplify keystrokes for the data-entry person.

As valuable as the previous menus and their capabilities are, the heart of the Med Express system is the Patient Visit Menu. Its upper message line contains a wellspring of pick lists, choices and options. Either the touch of a hot key or the movement of the cursor plus the enter button will pull down the powerful data contained under Patient, Visits, Report, Treatment, Outside, plus Exit.

The Patient screen shows the most recent medical record of the person, and the Report file can message the printer to produce an encounter form or treatment report.

Under Visits, prompts appear above the screen for each of the several selections grouped under the seven options available here. One option is transcription, which brings up the system's word pro-

cessing capabilities. An alternative choice is available for in-house notes that will not appear on the final treatment report. Checklists in this powerful section request physician responses to the patient's current disability status and outlooks on symptoms, activity, prognosis and rehabilitation. After inputting the patient's problem, an F7 look-up will display automatically find the closest ICD-9 code and diagnosis. The physician can search for alternative codes by scrolling through the comprehensive list or entering either the code number or name of diagnosis.

The Treatment file contains list after list of tests, consulting doctors, aspirations, immobilizations, injections, medications, results, physical therapy, occupational therapy and surgery. Some of the choices here go three or even five levels deep to achieve pinpoint accuracy of the

problem's location or results of a procedure.

Where outside tests, treatments or consultations are required, the Outside file offers lists from which the physician can choose the desired service.

The Med Express tracking system tallies all of this information visit by visit into the patient's encounter form. The system also can recall each visit separately to the screen.

Med Express will support a private practice of one or two physicians or a clinic of up to 20 physicians. It is PC-based. Minimum requirement is an IBM compatible computer with DOS 3.3, 2 megabyte RAM (although 4 or 8 are preferred) and 20 megabytes of free hard-disk space (although 80 megabytes of hard-disk is recommended for maximum speed).

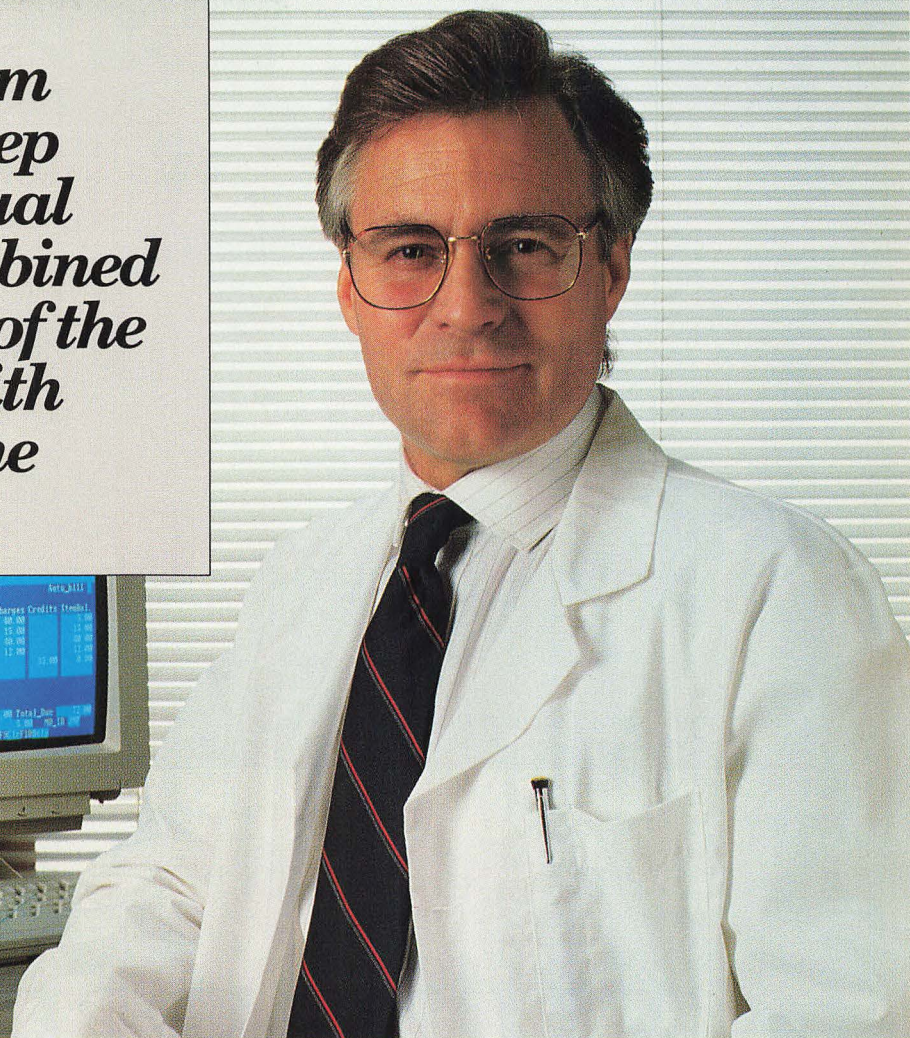
Med Express software is available by lease only. The cost is \$3,695 for software and installation, which includes quarterly updates. The system—bundled with options such as a modem and software that could include R&R, PC Anywhere, HiJaak and WordPerfect—can cost up to \$4,945. These prices are for a single physician; add \$1,500 for each additional physician.

Borelli says that this medical record tracking system is different from collections software that is designed to increase net profits. "This system," he says, "makes each patient encounter more meaningful. It tells work comp, for example, that you are caring for your patients and giving necessary care, not extra care. It's a step toward the ultimate goal of giving expert medical care."

For information on Med Express, contact Absolutely Essential Systems (AES) at 2510 Las Posas Road, Camarillo, Calif. 93010; (800) 350-7767 or (805) 389-6877. ■

Kay Schwerzler is a freelance writer from Schaumburg, Ill., and a frequent contributor to Physicians and Computers.

"MD VersaForm was an easy step from my manual system. It combined the simplicity of the ledger card with the power of the computer."



The MD VersaForm Patient Ledger System

MD VersaForm's screen is the patient ledger card.

Your office staff will be amazed at MD VersaForm's similarity to the familiar and comfortable ledger card system. The ledger provides a clear framework for the data. From one screen, you can easily view and modify all patient information.

MD VersaForm reports provide the information that I need to run my office.

Among the extensive reports are the Day Sheet, the Aged Accounts Receivable report, a Recall Appointments report, and Practice Analysis reports. But if you need reports specially designed for your practice, MD VersaForm contains a complete Report Generator that can compile and summarize any data that you have entered.

I can create a claim form simultaneously with updating charges in the ledger file.

Statements, superbills, and claim forms can be printed on demand or in batches, whenever you choose. As information is entered into MD VersaForm, it is automatically checked for accuracy and

completeness, thus improving the acceptance of claims. However, if you have to resubmit a claim, all the original information is easily retrieved.

With MD VersaForm, my patient information is secure.

Each MD VersaForm user can be assigned a unique password permitting use of the system. Additionally, you can restrict access to specific files and reports preventing unauthorized use of your financial information. And this same security extends through the network version.

I trained someone who had never worked with computers before.

Extensive use of menus and on-line tutorials allow MD VersaForm to be learned quickly, even by those who are not specially trained in the use of computers.

The excellent support has continued.

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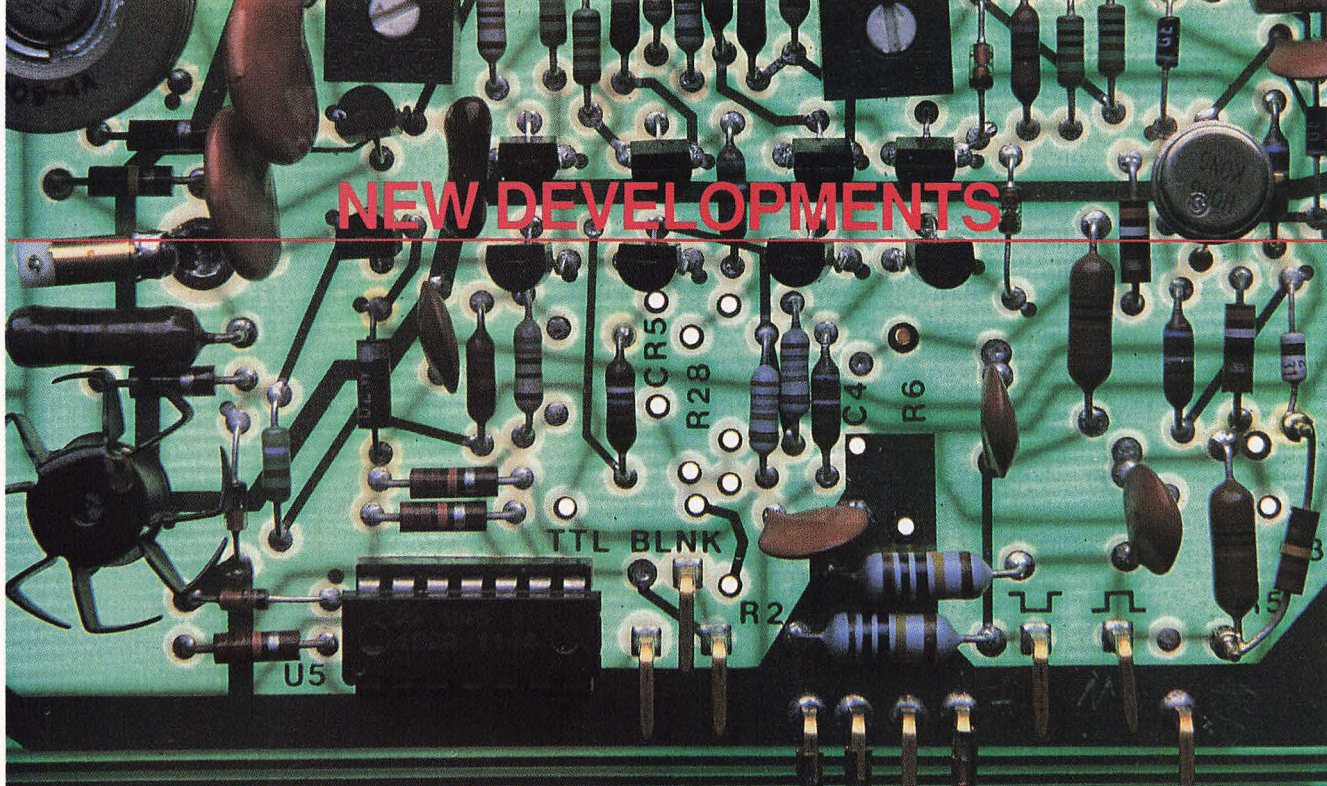
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THE RECESSION ADVANTAGE

Economic hard times make this a good time for physicians to take the plunge to computers.

BY RONNI HEINZE

The personal computer (PC) industry was one of the first to be hit by the recession. But the industry's problems can be good news for physicians who have been putting off computer purchases.

Hard times are benefiting buyers. Computer manufacturers have had to alter their marketing strategies to attract customers. The results are dramatically lower prices and new distribution channels designed for the convenience of purchasers. Sales are up, prices are down. Here's why now is the time to make the recession work for you.

New Strategies

Computer vendors are working hard, but not necessarily creating the latest technology that will make a PC operate a millisecond faster. They're creating new ways to make their products more appealing and accessible to customers, and one technique has been to cut prices.

Although some firms have always positioned themselves as low-price vendors, others have sought loftier goals, such as market-share leadership. But whatever the goal, all vendors have taken out their red pens and are slashing prices. Since late 1990, at least 20 different computer makers have lowered prices on PCs, laptops and portables. These vendors include some of the industry's best-known computer makers, including IBM, Compaq, Toshiba, Leading Edge, Dell Computer Corp., Apple Computer and Zenith Data Systems, as well as firms such as Commax, Zeos, Hyundai Electronics America, Outbound Systems, Inc., Safari and PC Brand.

Some firms have announced multiple cuts. Dell, for example has announced approximately five price reductions since August 1990, and Apple and IBM announced about two each.

Although price wars seemed to have peaked last year, computer industry journals still report surprise at how low prices are falling. In February, Apple cut prices on its low-end Macintosh systems as much as 37 percent, Dell products fell by 25 percent, and Digital Equipment Corporation (DEC) and Zenith Data Systems products were reduced by up to 36 percent. Apple even reduced prices on its popular PowerBook notebook computers. Deciding to live with smaller profit margins and seek broader market share by selling more lower-priced systems, Apple demonstrated a major shift in its strategy; in the past, the company chose to seek fewer higher-priced sales to make more money.

Another vendor strategy has been to restructure the firm in the hope of improving sales by either centralizing or decentralizing efforts. In December 1991, for example, IBM split its operations into autonomous companies so each can execute programs more quickly. In March, Apple reorganized its sales and

marketing departments for the sixth time in three years.

Companies also have established new marketing gimmicks to sell products. IBM instituted a trade-in program, Apple a rebate program. DEC is selling PCs via a mail-order operation. Industry insiders believe Compaq will move toward a direct sales approach as well. Gateway is selling by telephone, as is IBM, which now offers sales through an 800 number for both PS/1 and low-end PS/2 models as well as its OS/2 2.0 operating system software. Traditionally the company sold only through dealers, with the exception of a nationwide network of retail stores it operated in the 1980s, but sold to NyNex Corporation in 1986.

Another marketing trend is the emergence of a new class of retail outlets. Having moved out of the retail market altogether a few years ago, ComputerLand has moved back in, opening a SuperStore called ComputerLand Express in Roswell, Ga., near Atlanta. Speaking from the firm's Pleasanton, Calif., headquarters, spokesman Steve Taylor says the store is "doing great," with sales reaching nearly \$2 million a month.

ComputerLand had moved out of the retail business because it was being taken over by mail-order, Taylor explains. Then the firm concentrated on selling to large corporations. But consumers and small-business owners prefer to buy in discount warehouses, Taylor says, so ComputerLand took a closer look at the warehouse model to attract these customers. SuperStores don't require the membership fee that some discount outlets demand and they sell only computer and peripheral equipment. And, Taylor boasts, "No one has cheaper prices than ComputerLand Express." In fact, he says, the store is doing so well that ComputerLand will open another SuperStore in the Northeast soon, and several more in the next six to 12 months.

*All personal
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Apple also has started to sell in a broader range of outlets. In April the company announced that The Office Center at Sears will sell and service specially configured Macintosh computers and printer products. (Sears Office Centers are located in certain Sears Brand Central stores in Delaware, Illinois, Indiana, Michigan, New Jersey, New York, Pennsylvania, Virginia, Wisconsin and Washington, D.C.)

Apple also signed up several firms to distribute certain Macintosh products and peripherals to smaller Value-Added Resellers (VARs) to reach customers in various vertical markets. In addition, Apple signed up the retail division of CompuAdd Computer Corp., a mail-order firm that has opened 125 stores in 35 states. As one vendor put it, "We'll be where the customers demand."

Business is Booming

All these new marketing strategies are working. Dell reported fiscal 1991 revenues that were up a staggering 63 percent from the previous year.

The PC industry as a whole in calendar 1991 only increased its worldwide factory sales by 10.2 percent, according to industry analysts at Dataquest, Inc. IBM, which reported a dramatic loss of \$2.8 billion in 1991, reported earnings of \$595 million in its first quarter this year.

Apple's not suffering either, reporting a 3.1 percent rise in quarterly profit for its second quarter

ending March 27. According to Apple Chairman and Chief Executive Officer John Sculley, the company has shipped more than 200,000 of its PowerBook notebooks, which were introduced just last year.

Software sales are rising too. IBM reported in May that only six weeks after introduction of its new OS/2 operating system, it had shipped 200,000 copies of the software. This puts the company well ahead of sales estimates for the year of between 2 million and 4 million copies. Microsoft Corp. said it expects to ship about 10 million copies of its new Windows 3.1 software this year.

The Software Publishers Association reported that 1991 PC application sales increased 24.6 percent over 1990. Combined international

and North American sales were up 28 percent. And, for the first time since the association began tracking sales in 1988, North American sales in the fourth quarter grew faster, at 33.6 percent, than did international sales, at 23 percent.

Sales of Windows applications led the industry growth—up 228 percent in the fourth quarter and up 196 percent for the full year. Sales of Macintosh applications continued to grow faster than the industry average, growing 37 percent for the year. DOS, however, remained the best-selling application format.

In 1991, spreadsheet sales grew faster than other major categories—up 35 percent. Word processors remained the largest category, with an increase of 23.8 percent over 1990.

New tactics by vendors seem to portend a more sanguine future for the PC industry and better buys for us.

The PC Advantage

"The recession is not hurting PC sales in the small-business area," says Tom Virden, Apple's marketing manager for small business. "In a recession, small businesses look harder for things to help them. If users can increase their productivity, there is good value [in a Macintosh purchase]," he says. "It's a competitive advantage against those who aren't buying."

Apple markets such value, he adds. Virden denies that recent changes at Apple are the result of a reactive recession marketing shift. "We want to be a mainstream player," he explains. "It's all part of our market share strategy. We want to increase distribution and make our products affordable."

Both ComputerLand's Taylor and Virden agree that computer sales have evolved into a commodity business serving two types of customers. The sophisticated customers know what they want, when it's available, and how much it costs. They shop at Super-Stores. The second kind of customers are small-business people who are less knowledgeable about computers and want help with their purchase. They shop through VARs, consultants and special dealers.

Whatever type of customer you are, with prices as low as they've ever been, \$5,000 today might buy you a competitive advantage: a fairly powerful PC, operating system, application software—and you might even enough money left over for a printer. Now is clearly the time to buy. ■

Ronni Heinze is a freelance writer from Mill Valley, Calif., and a frequent contributor to Physicians and Computers.

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HOSPITALS



COMPUTERS IN QUALITY ASSESSMENT

As part of the push toward quality control, hospital designs system to track data on trends.

BY LESLIE CITROME, M.D.,
F.R.C.P.(C)

Continuous Quality Improvement, which has become a vital part of U.S. industry, is critical to health care as well. And computers can help health care providers monitor and improve quality.

The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) actively encourages physician involvement in Quality Assessment/Quality Improvement activities (QA/QI). Since JCAHO accreditation is considered highly desirable, if not essential, for most hospitals, physicians are asked to play a vital role in trend analysis and recommendations for Continuous

Quality Improvement (CQI). The acronyms of QA/QI/CQI are becoming more familiar to practitioners and administrators alike, and both need to collaborate in order to produce relevant data for analysis. Described here is a system developed at the FDR VA Hospital in Monrovia, N.Y., while the author was Assistant Chief of the Psychiatry Service.

Incident reports are generated whenever an unusual or untoward event has occurred, eg. patient fall, assault, unexpected death, medication error, etc. Tracking these events by ward, month and type can reveal important information useful in quality assessment and risk management.

Most VA hospitals have one or more mainframe computers (DEC PDP-11 or VAX minicomputers) connected to at least several dozen terminals (Decentralized Hospital Computer Program—DHCP). Data can be entered onto central storage and retrieved at any terminal. Simple analysis can take place but can be time-consuming because system resources are not equipped to handle demanding tasks over several terminals at once. The DHCP does not afford the greater flexibility available on a freestanding IBM compatible personal computer. An innovative mating of the DHCP and PC was accomplished to provide high quality analysis and reporting. This scenario may be similar to other systems in municipal and private hospitals where minicomputers co-exist (sometimes not peacefully) with personal computers.

The FDR VA Hospital is a 900 bed neuropsychiatric facility with a large geriatric population. Over the course of a typical month, up to 150 incident reports are generated for a variety of events (Figure 1). The basic facts are entered by Nursing Service into a specially created data base on the DHCP. Tracking initially was done by using the formatting tools available on the DHCP but was limited in terms of slow execution speed, burdensome template construction and limited graphical output possibilities. Nursing Service initiated a new graphical output system by using the numbers of incidents per unit per month and manually entering these on a PC using a spreadsheet program. Graphs were then generated one at a time for incidents per ward by month using a presentation

Incident reports tracking these events by ward, month and type can reveal important information useful in quality assessment and risk management.

graphics program. Limitations to this approach included the manual entering of numerical data (slow), the manual setup needed to print each chart (slow), the lack of a general trending chart that includes the entire hospital, and more importantly, the lack of tracking by incident type.

The author developed an automated system that transformed and enhanced the above procedure into a one-button process, taking little time and providing high-quality graphs and tables using a laser printer. The extensive programming work was undertaken by a psychologist who had a comprehensive background in computers.

The Method

Using a PC equipped with a modem, a 90 line script was written that instructs the communications software (Procomm Plus) to call the DHCP and download the incident report file as of a specified date. Another program (300 lines of BASIC) reads the downloaded information and edits it for import into a dBase IV data base. The programming capabilities of dBase IV are subsequently used for further organization and analysis (1200 lines of dBase IV).

The flexibility afforded by the PC enables sorting and counting by any of the fields recorded: name, age, date, time, location, and/or type of incident. For the purposes of the hospital's Incident Report Committee,

the following items were required: a graph of hospital incidents over time, graphs of incidents per ward over time, tabular data of incident type per unit for a given month, tabular data of assaultive incidents per unit for the prior two years by month, tabular data of alleged patient abuse incidents per unit for the prior two years by month, tabular data of code Z—"Not an Incident" (eg. expected death initially reported as an incident) per unit for the prior two years by month, and tabular data for each incident where the severity of injury was noted to be critical.

Production of the above normally would take many hours to prepare on a monthly basis, but by taking advantage of the dBase IV programming language, as well as the automated processing features (key-stroke macros generated on the fly) of the presentation graphics software (Harvard Graphics), a one-step process was developed. The user invokes the program and is prompted for his or her ID code and password, as well as a starting date for when the data should be collected (and added to the data base already stored on the PC). The program then dials the DHCP, downloads the data and produces the output on a high-quality laser printer.

The Results

Results of the system are shown in Figures 1 and 2; the data contained in the figures are fabricated in order

INCIDENTS BY UNIT AND TYPE December 1990																				Type
Type	Description	W-1	W-2	W-3	W-4	W-5	W-6	W-7	W-8	W-9	W-10	W-11	W-12	W-13	W-14	W-15	W-16	W-17	W-18	Totals
A	Suicide Gesture	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B	Attempted Suicide	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	Suicide	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	Alleged Pt Abuse	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
D2	Sustained Pt Abuse	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E1	Falls with Pt Injury	1	3	1	1	2	0	1	0	3	0	1	2	1	1	0	0	1	0	18
E2	Falls w/o Pt Injury	0	3	1	1	2	0	0	0	5	0	3	2	0	0	0	1	0	0	18
F1	Rx Err--Poss Inj Pt	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
F2	Other Rx Errors	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F3	Allergic Reac Anes/Rx	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F4	Idio Reac Blood/Prod	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F5	Transfusion Error	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G1	Unexpected Death	0	0	0	0	0	1	0	0	0	2	1	0	0	0	0	0	0	0	4
G2	Death w/in 24 hr Adm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G3	Homicide	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H	Pt Injury/not Falls	0	0	0	2	0	0	0	0	1	0	1	1	0	0	0	1	0	1	7
I	Rac/other Activity	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
J	Caused by another Pt	0	0	2	0	0	0	1	0	6	0	0	1	3	0	4	2	3	0	22
K1	Occurring during Tx	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
K2	Diagnostic Error	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
K3	No Informed Consent	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
L	Adverse Reactn to Rx	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
M	UA/committed/Locked	2	0	0	0	0	0	0	0	2	0	0	0	0	1	0	1	0	0	6
N	Pt Involved in Fire	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
O	Seizures, Dizziness	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2
P	Assaultive Behavior	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
P1	Pt-on-Pt Assault	0	0	2	0	0	0	1	0	6	0	0	0	0	0	0	0	1	0	11
P2	Pt-on-Staff Assault	0	1	0	0	0	1	0	0	1	0	0	0	1	0	1	0	0	0	5
P3	Rslc Disabl/Disfigur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
P4	Rape/Attempted Rape	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Q	Self-Inflicted Inj	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	3
R	Choking	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S	Off-Station Injury	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T	Burns (Cig, Hot Lqd)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
U	Ingest Non-Edibl Sub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
V	Substance Abuse	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
W	Unknown Cause	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	3
X	Other	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	3
Unit Totals:		3	9	8	5	4	2	3	0	28	2	8	9	11	2	11	4	11	3	123

Figure 1: A sample table of incidents by type and by ward for a given month.

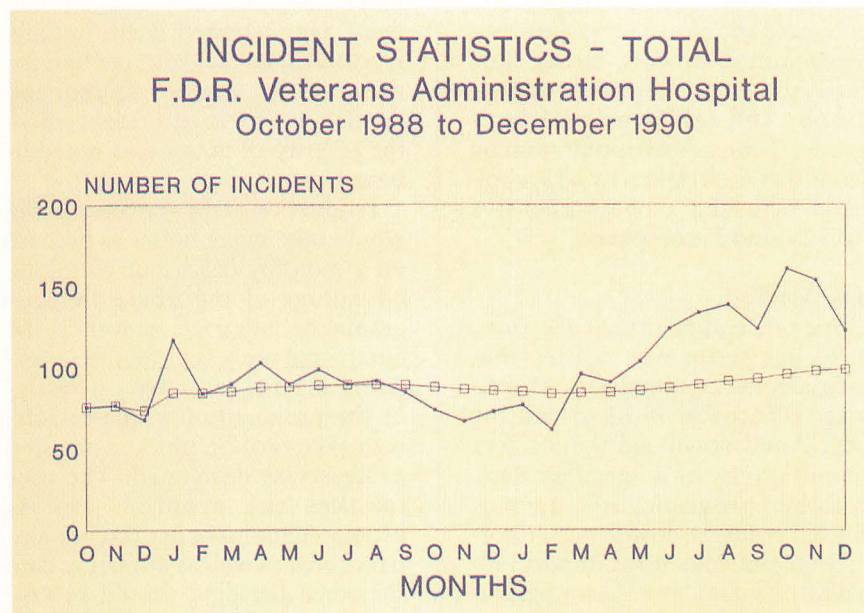


Figure 2: A sample graph of hospital incidents over time, including a running average.

to maintain confidentiality. Figure 2 shows a graph of incidents by ward over time, and also plots a running average. This allows the Incident Report Committee to visualize an

expected range and facilitates flagging of trends.

The Incident Report Committee is an interdisciplinary team composed of clinical staff mainly at the

Service Chief level. Meeting monthly, they are charged with reviewing incidents, evaluating trends and recommending actions to help reduce the incident rate and subsequent injury to patients and staff. The data produced by the computer system enable the effective trending needed and serve as an important component of the hospital's quality assurance and risk management system.

The system can be easily ported to other VA Medical Centers that record patient incidents on the DHCP. It is expandable to generate reports regarding incidents by shift, patient, level of injury, day of week and so on. It is limited only to the information downloaded from the DHCP. Since the system platform consists of standard software packages, it is relatively economical.

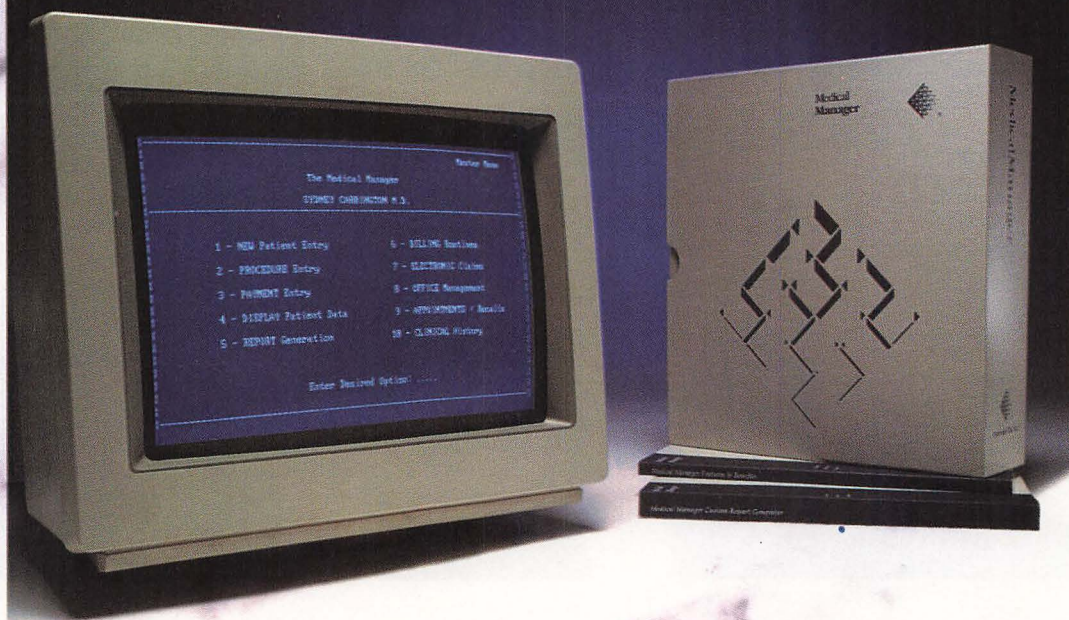
It is conceivable that other data can be downloaded from the DHCP and be reviewed using the sophisticated analytic tools available on a PC. For example, selected patient information data fields can be cross-referenced with admission dates and incidents, providing clinical measures for prediction and planning.

It is essential that physicians be involved in developing systems so that they can ensure their clinical relevance. Encouraging familiarity with computers will also spur on new ideas that can lead to further automation and save valuable time.

For more information on the system, contact Leslie Citrome, M.D., Clinical Director, Middletown Psychiatric Center, P.O. Box 1453, Middletown, N.Y. 10940; phone, (914) 342-2614; fax, (914) 342-4975. ■

Leslie Citrome, M.D., F.R.C.P.(C) is the clinical director of the Middletown (N.Y.) Psychiatric Center and assistant clinical professor in the Department of Psychiatry at the Mount Sinai School of Medicine, New York.

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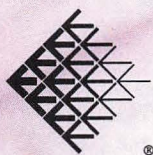
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IT'S IN THE CARDS

Physician uses HyperCard to develop office management software to meet the specific needs of his practice.

BY PETER J. BOWER, M.D.

About a year and a half ago, I opened a practice in rehabilitation medicine, treating non-surgical occupational, sports and personal injuries. Having been in a solo practice 12 years ago and understanding the substantial overhead involved in running a primary care practice, I set

out this time to try and meld what appeared to be diametrically opposed ideals: to provide quality care at a rational, enjoyable pace, and to make a financially viable practice. To accomplish this goal, I looked toward automation to manage my practice.

I knew how to program, so, using a Macintosh Portable and then moving to the Apple PowerBook 170, I began developing my own office

management "solution software." I wanted an interface that would allow all of the typical office management and report functions to be executed by mouse clicks. I wanted very little typing and the ability to perform data-base management of all patient demographics, reports, bills and collections, as well as the ability to generate financial reports.

After evaluating several data-base management software pack-

ages, I decided on the HyperCard as the fundamental framework for my medical office management. HyperCard is an interrelational data-base program. With it the user can develop customized data entry forms, called cards, that have data fields defined by the user and have icon-driven macros, called buttons, for processing data. Each card is unique and bundled into a "stack" of similar cards. Data from any card may be shared with any other card in its stack or with any other stack.

This ability to share data between stacks has sped the development of my application. Every aspect of my office and patient management is interrelated and accessible. I initially defined a patient demographic data entry form. Every patient in my practice is represented by a unique card that is easily modified and searched by built-in HyperCard functions. The demographic card for any patient acts as a springboard from which a click on any number of buttons launches specific tasks, all referenced to the demographic card visible on the computer screen.

Constructing Reports

My practice requires that I produce a report from essentially every patient encounter. I next began to develop a report generator. Clicking on the "manager" button, a new stack opens referenced to all the demographic information on the previous window. This stack has a number of utilities that allow the "construction" of a report in specific steps.

The subjective history is derived from three sources. First, there is an extensive questionnaire for initial evaluations or a more specific problem-oriented one for follow-up visits that the patient fills out prior to our visit. This questionnaire is constructed in a multiple-choice manner, lending itself to a simple click entry system for data input.

Second, there is a specific problem-centered menu where changes in the nature of complaints and other subjective function and symptom characteristics are noted. Finally, there is the ability to type in information in either small or large bundles and identify them as belonging to a specific problem.

The report generator will take these three sources of information and produce a narrative report that is sequenced according to problem.

The physical exam is recorded as it is done. Given the routine nature of examinations and the finite number of both exam tests and findings, it was easiest to develop a system of "hierarchical pop-up menus" to move through this mass of information quickly and specifically. If a patient was found to have tenderness and spasm in the left rhomboid minor muscle, for example, a hierarchical selection would be: left, rhomboid minor, tenderness and spasm.

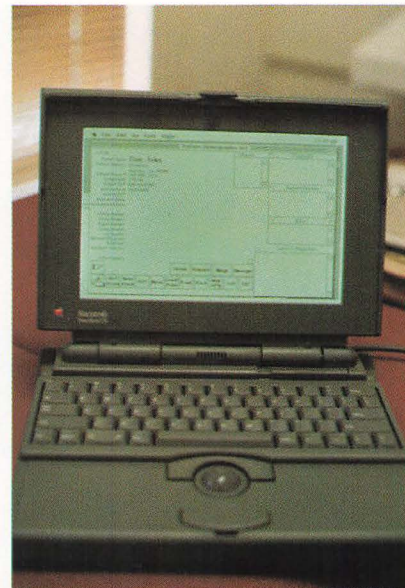
The diagnosis is chosen with the same pop-up menu. At this time an insurance billing form is initiated with the patient's demographic information entered and the diagnosis from the report entered with appropriate codes.

The discussion or plan section on the report is similarly selected. There are multiple pull-down menus grouped by titles such as "Work Restriction," "Medications," "Laboratory Tests" and "Special Services." One nice feature of HyperCard is that it is very easy to modify these selections. If a new test becomes available, all I need to do is type it in once and it integrates into the program. The same is true for all of the menu selections.

Help with Billing

The bill is generated once charges are added by clicking on the correct billing descriptors.

All of the data that go into the report are saved in a data base that allows searches to be used to



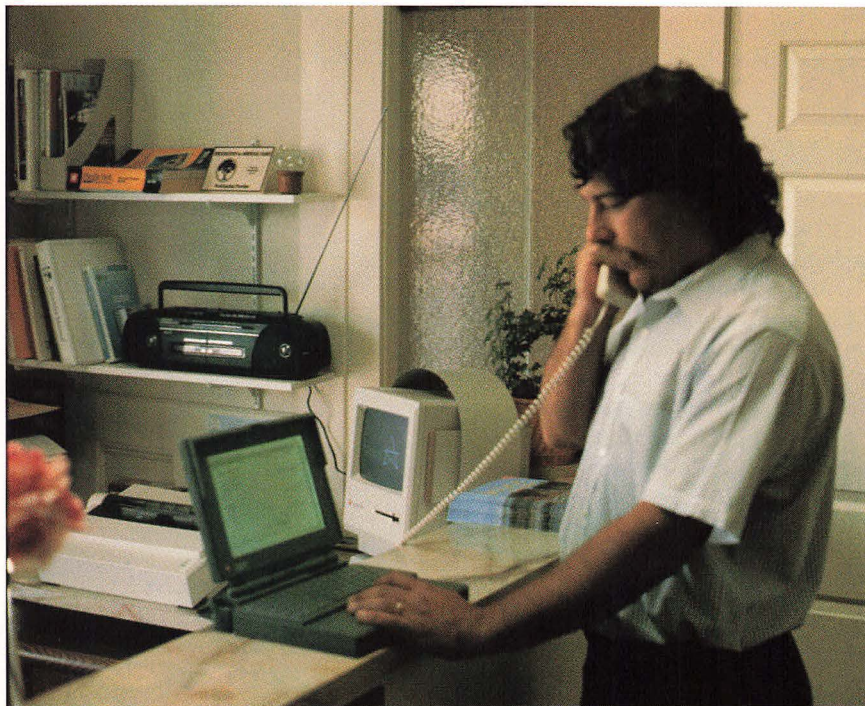
Dr. Bower's HyperCard-based program can be used on a laptop computer.

graphically display trends in the patient's progress. The patient's subjective impression of symptom severity or the objectively measured range of motion of a joint can be displayed through time. I find graphics like these are particularly useful in explaining patient management decisions to insurance companies.

A quick pull-down menu is clicked to identify where copies of the report and bill are to go, i.e. referral physicians, lawyers, etc. The last step is a spell checker if any information was added by manual typing, just to be sure no typographical errors slip through.

The reports and bills are printed out in batches sequenced together with a routing sheet if more than one person gets a copy of the report.

If I am diligent and don't waste much time drinking coffee, I can literally see and generate the report and bill within five minutes after seeing a patient. There are times when I do dictate a lengthy discussion or complex history. Then



The HyperCard-based system makes office management more efficient, freeing the physician to maintain better patient contact.

the report generator will splice in the dictation from a disk that my transcriptionist supplies me. The vast majority of my patient interactions are quite adequately documented without manual typing. In fact, the documentation is well constructed, consistent report to report, and supplies both referral physicians and insurance companies all the information that they may require.

Accounting is done on a daily basis. My one employee answers phones and does the data entry on our office computer, a Macintosh IIfx. The day sheet is kept on computer, as is the appointment log. As the mail is opened, insurance payments are entered and referenced to the original bill by the specific charges. I am able to search and monitor reimbursement from different carriers and attempt, at least, to maximize my collections. As the daily insurance payments are

received and entered, a banking deposit slip is filled out.

A current summary of the status of accounts is generated. I use this summary once a month to monitor and take action on outstanding bills. Essentially, I can scan the pending bills by age and review collections activity as well as do things like send out customized complaint letters to insurance companies for tardy payments. I even have the option to generate a 10 percent penalty charge to the insurance company if they have delayed my payment more than 60 days. All of this with clicks of a mouse.

Customizing Features

I added a few other features as time went on. One handy one is a patient-recall tickler file. Recall letters from several different stock formats can be generated automatically for printing and mailing, or more custom actions can be initiated after a simple reminder on the screen.

Like some commercially available software, this program generates custom reports on my letterhead as well as insurance bills and reports on plain paper. I use a Hewlett Packard DeskJet printer, which I find provides sturdy, inexpensive, hassle-free, quiet performance.

In order to speed patient demographic entry, I constructed another stack of insurance company names, addresses, phone numbers and contact people. This is accessed by another pull-down menu when patient data is being entered. Once again, the ease with which data bases of many different types can be integrated within HyperCard made this a very easy process to develop.

I know of at least one "off the shelf" program that does many of the things mine will do. But none that I've seen has the patient-report generating capability of mine in such a small system. I rarely need to employ a transcriptionist and have the good feeling of having all of my paper work complete by the end of the day. The aspect of timely reporting to insurance companies and referral physicians is another definite strong point for this type of system.

I suppose this type of project isn't for everyone. But for people like me, who enjoy the process of programming, it is possible to design a system that fits like a glove. If an idea for an improvement strikes me, I often can program it on the fly and see the results immediately.

My program will run on any Macintosh computer with 4 megabytes of RAM and a 20 megabyte hard disk. It is compatible with system 6.0.5 and up. I have no plans to market it, but I would be happy to respond to anyone interested enough to drop me a line at 418 Petaluma Ave., Sebastopol, Calif. 95472. ■

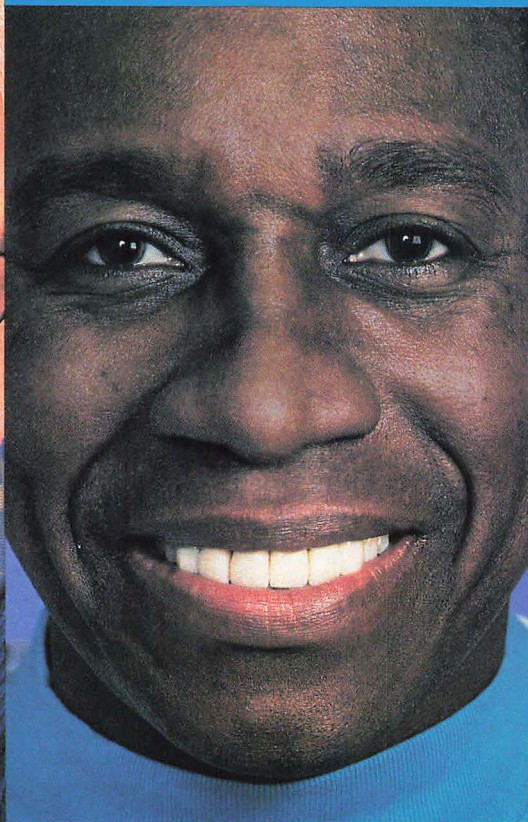
Dr. Peter J. Bower has a practice in Musculoskeletal Medicine in Sebastopol, Calif.

180/120



In hypertension,
**HANDLE THEIR PRESSURE,
WHATEVER THE LEVEL**

152/110



140/96



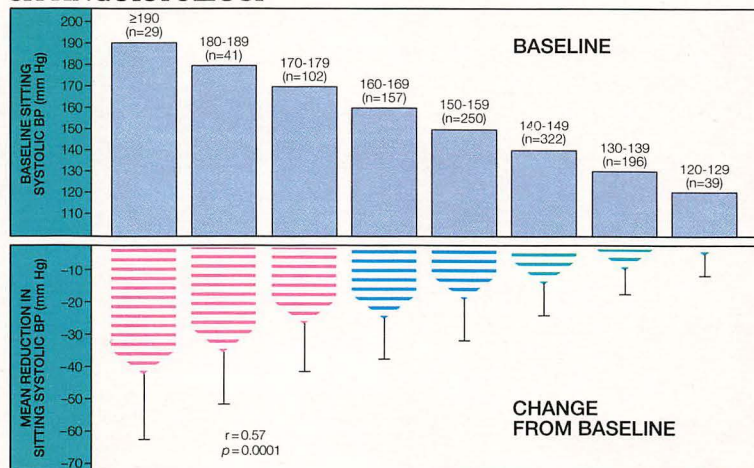
The Measured Response of
Once-a-Day
Procardia XL®
(nifedipine) Extended Release
Tablets 30 mg, 60 mg and 90 mg GITS

**BLOOD PRESSURE (BP)
REDUCTIONS THAT
CORRELATE WITH
BASELINE ELEVATIONS**

Please see brief summary of prescribing information on adjacent page.

© 1992, Pfizer Inc

SITTING SYSTOLIC BP¹



Multicenter, open-label study of the efficacy and safety of PROCARDIA XL included 1155 patients with mild to moderate hypertension (sitting diastolic BP between 95 and 110 mm Hg). After a 2-wk placebo period, PROCARDIA XL was started at 30 mg qd and titrated to a maximum dose of 180 mg qd over 1-6 wk to achieve goal BP (sitting diastolic BP < 90 mm Hg and a ≥ 10 mm Hg reduction from baseline); 1136 patients were evaluated at their final visit for changes in systolic BP. One 30-mg-qd adjustment of PROCARDIA XL was permitted during the 12-wk efficacy phase. All BP measurements were made 24 h after the last drug dose. Mean dose at final visit: 89±47 mg qd. (Data on file.)

The Measured Response of Once-a-Day **PROCARDIA XL**[®] (nifedipine) Extended Release Tablets 30 mg, 60 mg and 90 mg GITS

HANDLES THEIR PRESSURE, WHATEVER THE LEVEL

Whatever Their Baseline Elevations,
Start Your Hypertensive Patients on
Convenient, Once-a-Day PROCARDIA XL

- Start patients on a single 30-mg or 60-mg PROCARDIA XL Extended Release Tablet, swallowed whole, once a day, and titrate as clinically warranted
- In hypertension, doses above 120 mg are not recommended
- Side effects include peripheral edema, which is not associated with fluid retention, and headache

PROCARDIA XL Also Provides 24-Hour Control of Angina²

- In angina, doses above 90 mg should be used with caution and only when clinically warranted

References: 1. Data on file. Pfizer Inc, New York, NY. 2. Bittar N. Usefulness of nifedipine for myocardial ischemia and the nifedipine gastrointestinal therapeutic system. *Am J Cardiol.* 1989;64:31F-34F.

Brief Summary

PROCARDIA XL[®] (nifedipine) Extended Release Tablets

CONTRAINDICATIONS: Known hypersensitivity reaction to nifedipine.

WARNINGS: **Excessive Hypotension:** Although in most angina patients the hypotensive effect of nifedipine is modest and well tolerated, occasional patients have had excessive and poorly tolerated hypotension. These responses have usually occurred during initial titration or at the time of subsequent upward dosage adjustment, and may be more likely in patients on concomitant beta blockers.

Severe hypotension and/or increased fluid volume requirements have been reported in patients receiving nifedipine together with a beta-blocking agent who underwent coronary artery bypass surgery using high dose fentanyl anesthesia. The interaction with high dose fentanyl appears to be due to the combination of nifedipine and a beta blocker, but the possibility that it may occur with nifedipine alone, with low doses of fentanyl, in other surgical procedures, or with other narcotic analgesics cannot be ruled out. In nifedipine-treated patients where surgery using high dose fentanyl anesthesia is contemplated, the physician should be aware of these potential problems and if the patient's condition permits, sufficient time (at least 36 hours) should be allowed for nifedipine to be washed out of the body prior to surgery.

The following information should be taken into account in those patients who are being treated for hypertension as well as angina.

Increased Angina and/or Myocardial Infarction: Rarely, patients, particularly those who have severe obstructive coronary artery disease, have developed well documented increased frequency, duration and/or severity of angina or acute myocardial infarction on starting nifedipine or at the time of dosage increase. The mechanism of this effect is not established.

Beta Blocker Withdrawal: It is important to taper beta blockers if possible, rather than stopping them abruptly before beginning nifedipine. Patients recently withdrawn from beta blockers may develop a withdrawal syndrome with increased angina, probably related to increased sensitivity to catecholamines. Initiation of nifedipine treatment will not prevent this occurrence and on occasion has been reported to increase it.

Congestive Heart Failure: Rarely, patients usually receiving a beta blocker, have developed heart failure after beginning nifedipine. Patients with tight aortic stenosis may be at greater risk for such an event, as the unloading effect of nifedipine would be expected to be of less benefit to those patients, owing to their fixed impedance to flow across the aortic valve.

PRECAUTIONS: General—Hypotension: Because nifedipine decreases peripheral vascular resistance, careful monitoring of blood pressure during the initial administration and titration of nifedipine is suggested. Close observation is especially recommended for patients already taking medications that are known to lower blood pressure. (See WARNINGS.)

Peripheral Edema: Mild to moderate peripheral edema occurs in a dose dependent manner with an incidence ranging from approximately 10% to about 30% at the highest dose studied (180 mg). It is a localized phenomenon thought to be associated with vasodilation of dependent arterioles and small blood vessels and not due to left ventricular dysfunction or generalized fluid retention. With patients whose angina or hypertension is complicated by congestive heart failure, care should be taken to differentiate this peripheral edema from the effects of increasing left ventricular dysfunction.

Other: As with any other non-deformable material, caution should be used when administering PROCARDIA XL in patients with preexisting severe gastrointestinal narrowing (pathologic or iatrogenic). There have been rare reports of obstructive symptoms in patients with known strictures in association with the ingestion of PROCARDIA XL.

Laboratory Tests: Rare, usually transient, but occasionally significant elevations of enzymes such as alkaline phosphatase, CPK, LDH, SGOT, and SGPT have been noted. The relationship to nifedipine therapy is uncertain in most cases, but probable in some. These laboratory abnormalities have rarely been associated with clinical symptoms; however, cholestasis with or without jaundice has been reported. A small (5.4%) increase in mean alkaline phosphatase was noted in patients treated with PROCARDIA XL. This was an isolated finding not associated with clinical symptoms and it rarely resulted in values which fell outside the normal range. Rare instances of allergic hepatitis have been reported. In controlled studies, PROCARDIA XL did not adversely affect serum uric acid, glucose, or cholesterol. Serum potassium was unchanged in patients receiving PROCARDIA XL in the absence of concomitant diuretic therapy, and slightly decreased in patients receiving concomitant diuretics.

Nifedipine, like other calcium channel blockers, decreases platelet aggregation *in vitro*. Limited clinical studies have demonstrated a moderate but statistically significant decrease in platelet aggregation and increase in bleeding time in some nifedipine patients. This is thought to be a function of inhibition of calcium transport across the platelet membrane. No clinical significance for these findings has been demonstrated.

Positive direct Coombs test with/without hemolytic anemia has been reported but a causal relationship between nifedipine administration and positivity of this laboratory test, including hemolysis, could not be determined.

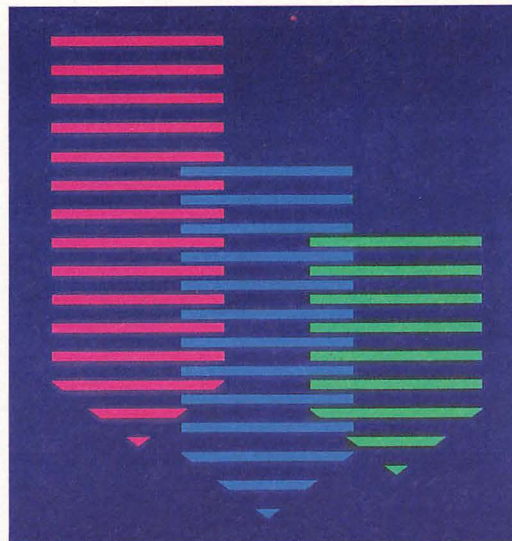
Although nifedipine has been used safely in patients with renal dysfunction and has been reported to exert a beneficial effect in certain cases, rare reversible elevations in BUN and serum creatinine have been reported in patients with pre-existing chronic renal insufficiency. The relationship to nifedipine therapy is uncertain in most cases but probable in some.

Drug Interactions—Beta-adrenergic blocking agents: (See WARNINGS) Experience in over 1400 patients with PROCARDIA capsules in a noncomparative clinical trial has shown that concomitant administration of nifedipine and beta-blocking agents is usually well tolerated but there have been occasional literature reports suggesting that the combination may increase the likelihood of congestive heart failure, severe hypotension, or exacerbation of angina.

Long Acting Nitrates: Nifedipine may be safely co-administered with nitrates, but there have been no controlled studies to evaluate the antianginal effectiveness of this combination.

Digitalis: Administration of nifedipine with digoxin increased digoxin levels in nine of twelve normal volunteers. The average increase was 45%. Another investigator found no increase in digoxin levels in thirteen patients with coronary artery disease. In an uncontrolled study of over two hundred patients with congestive heart failure during which digoxin blood levels were not measured, digitalis toxicity was not observed. Since there have been isolated reports of patients with elevated digoxin levels, it is recommended that digoxin levels be monitored when initiating, adjusting, and discontinuing nifedipine to avoid possible over- or under-digitalization.

For Oral Use



Coumarin Anticoagulants: There have been rare reports of increased prothrombin time in patients taking coumarin anticoagulants to whom nifedipine was administered. However, the relationship to nifedipine therapy is uncertain.

Cimetidine: A study in six healthy volunteers has shown a significant increase in peak nifedipine plasma levels (80%) and area-under-the-curve (74%), after a one week course of cimetidine at 1000 mg per day and nifedipine at 40 mg per day. Ranitidine produced smaller, non-significant increases. The effect may be mediated by the known inhibition of cimetidine on hepatic cytochrome P-450, the enzyme system probably responsible for the first-pass metabolism of nifedipine. If nifedipine therapy is initiated in a patient currently receiving cimetidine, cautious titration is advised.

Carcinogenesis, Mutagenesis, Impairment of Fertility: Nifedipine was administered orally to rats, for two years and was not shown to be carcinogenic. When given to rats prior to mating, nifedipine caused reduced fertility at a dose approximately 30 times the maximum recommended human dose. *In vivo* mutagenicity studies were negative.

Pregnancy: Pregnancy Category C. Nifedipine has been shown to be teratogenic in rats when given in doses 30 times the maximum recommended human dose. Nifedipine was embryotoxic (increased fetal resorptions, decreased fetal weight, increased stunted forms, increased fetal deaths, decreased neonatal survival) in rats, mice, and rabbits at doses of from 3 to 10 times the maximum recommended human dose. In pregnant monkeys, doses 2/3 and twice the maximum recommended human dose resulted in small placentas and underdeveloped chorionic villi. In rats, doses three times maximum human dose and higher caused prolongation of pregnancy. There are no adequate and well controlled studies in pregnant women. PROCARDIA XL[®] (nifedipine) Extended Release Tablets should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

ADVERSE EXPERIENCES: Over 1000 patients from both controlled and open trials with PROCARDIA XL Extended Release Tablets in hypertension and angina were included in the evaluation of adverse experiences. All side effects reported during PROCARDIA XL Extended Release Tablet therapy were tabulated independent of their causal relation to medication. The most common side effect reported with PROCARDIA XL was edema which was dose related and ranged in frequency from approximately 10% to about 30% at the highest dose studied (180 mg). Other common adverse experiences reported in placebo-controlled trials include: headache (15.8%, compared to 9.8% placebo incidence); fatigue (5.9%, compared to 4.1% placebo incidence); dizziness (4.1%, compared to 4.5% placebo incidence); constipation (3.3%, compared to 2.3% placebo incidence); and nausea (3.3%, compared to 1.9% placebo incidence). Of these, only edema and headache were more common in PROCARDIA XL patients than placebo patients.

The following adverse reactions occurred with an incidence of less than 3.0%. With the exception of leg cramps, the incidence of these side effects was similar to that of placebo alone: *body as a whole/systemic:* asthenia, flushing, pain; *cardiovascular:* palpitations; *central nervous system:* insomnia, nervousness, paresthesia, somnolence; *dermatologic:* pruritus, rash; *gastrointestinal:* abdominal pain, diarrhea, dry mouth, dyspepsia, flatulence, *musculoskeletal:* arthralgia, leg cramps; *respiratory:* chest pain (non-specific), dyspnea; *urogenital:* impotence, polyuria.

Other adverse reactions were reported sporadically with an incidence of 1.0% or less. These include: *body as a whole/systemic:* face edema, fever, hot flashes, malaise, periorbital edema, rigors; *cardiovascular:* arrhythmia, hypotension, increased angina, tachycardia, syncope; *central nervous system:* anxiety, ataxia, decreased libido, depression, hyperreflexia, hypoesthesia, migraine, parosmia, tremor, vertigo; *dermatologic:* alopecia, increased sweating, urticaria, purpura; *gastrointestinal:* eructation, gastroesophageal reflux, gum hyperplasia, melena, vomiting, weight increase; *musculoskeletal:* back pain, gout, myalgias; *respiratory:* coughing, epistaxis, upper respiratory tract infection, respiratory disorder, sinusitis; *sense organs:* abnormal lacrimation, abnormal vision, taste perversion, tinnitus; *urogenital/reproductive:* breast pain, dysuria, hematuria, nocturia.

Adverse experiences which occurred in less than 1 in 1000 patients cannot be distinguished from concurrent disease states or medications.

The following adverse experiences, reported in less than 1% of patients, occurred under conditions (e.g., open trials, marketing experience) where a causal relationship is uncertain: gastrointestinal irritation, gastrointestinal bleeding.

In multiple-dose U.S. and foreign controlled studies with nifedipine capsules in which adverse reactions were reported spontaneously, adverse effects were frequent but generally not serious and rarely required discontinuation of therapy or dosage adjustment. Most were expected consequences of the vasodilator effects of Procridia. Adverse experiences reported in placebo-controlled trials include: dizziness, lightheadedness, and giddiness (27%, compared to 15% placebo incidence); flushing, heat sensation (25%, compared to 8% placebo incidence); headache (23%, compared to 20% placebo incidence); weakness (12%, compared to 10% placebo incidence); nausea, heartburn (11%, compared to 8% placebo incidence); muscle cramps, tremor (8%, compared to 3% placebo incidence); peripheral edema (7%, compared to 1% placebo incidence); nervousness, mood changes (7%, compared to 4% placebo incidence); palpitation (7%, compared to 5% placebo incidence); dyspnea, cough, and wheezing (6%, compared to 3% placebo incidence); and nasal congestion, sore throat (6%, compared to 8% placebo incidence).

There is also a large uncontrolled experience in over 2100 patients in the United States. Most of the patients had vasospastic or resistant angina pectoris, and about half had concomitant treatment with beta-adrenergic blocking agents. The relatively common adverse events were similar in nature to those seen with PROCARDIA XL.

In addition, more serious adverse events were observed, not readily distinguishable from the natural history of the disease in these patients. It remains possible, however, that some or many of these events were drug related. Myocardial infarction occurred in about 4% of patients and congestive heart failure or pulmonary edema in about 2%. Ventricular arrhythmias or conduction disturbances each occurred in fewer than 0.5% of patients.

In a subgroup of over 1000 patients receiving PROCARDIA with concomitant beta blocker therapy, the pattern and incidence of adverse experiences was not different from that of the entire group of Procridia treated patients. (See PRECAUTIONS.)

In a subgroup of approximately 250 patients with a diagnosis of congestive heart failure as well as angina, dizziness or lightheadedness, peripheral edema, headache or flushing each occurred in one in eight patients. Hypotension occurred in about one in 20 patients. Syncope occurred in approximately one patient in 250. Myocardial infarction or symptoms of congestive heart failure each occurred in about one patient in 15. Atrial or ventricular dysrhythmias each occurred in about one patient in 150.

In post-marketing experience, there have been rare reports of exfoliative dermatitis caused by nifedipine.

More detailed professional information available on request.

Revised July 1990



COMING EVENTS

Clinical Computing Course Offered

The Harvard Medical School is offering "Clinical Computing and Patient Care: What the Clinician Needs to Know" on Oct. 1 and 2 at the Sheraton Boston Hotel & Towers in Boston.

This course is designed to help clinicians influence the direction of computing at their hospitals. Most U.S. hospitals have computer systems, but most were purchased for accounting functions and they do not fully meet the needs of the doctors and nurses. Many hospitals are planning major hardware or software purchases, and good administrators have asked for the input of clinicians into these purchase decisions. This course is designed to give clinicians the information they need to ask dis-

criminating questions and understand the answers.

Clinicians who take "Clinical Computing in Patient Care" will learn about the design principles used in the country's most successful computing systems, questions they should ask vendors, functions needed for good clinical computing, and the sociopolitical barriers to good clinical computing.

The course is directed by Dr. Charles Safran, director of research at the Center for Clinical Computing at the Harvard Medical School. For information or to register, contact Lori Gershaw, 444B Broadway, #218, Saugus, Mass. 01906; (617) 324-2202.

Oct. 8-9

Florida Heart Institute at Florida Hospital, "Current Modalities in Acute Care: Card. Hem/Onc., Neur, Ortho and Risk Management," Stouffer Grand Beach Resort, St. Thomas, V.I. More information, (800) 669-1575.

Oct. 8-10

Shadyside Hospital, "Family Physicians Approach to Important Clinical Problems," Westin William Penn, Pittsburgh. More information, (412) 623-2393.

Oct. 9-10

Institute for Medical Studies, "Cardiology Update: Clinically Oriented Review Plus Hands-On Workshops," Pittsburgh. More information, (800) 248-9955.

Oct. 9-11

Futura Media Services, "Cardiac Pacing Update 1992," Wyndham Paradise Valley, Scottsdale, Ariz. More information, (914) 241-3295.

Oct. 9-11

Medical College of Georgia School of Medicine, "Frontiers in Nutrition," Hilton Head Island, S.C. More information, (800) 221-6437.

Oct. 9-11

Oregon Health Sciences University, "Salishan Conference: Cardiology in Primary Care Medicine," Salishan Lodge, Gleneden Beach, Ore. More information, (503) 494-8700.

Oct. 9-12

Harvard Medical School Department of CE, "Clinical Cardiac: Electrophysiology," Park Plaza Hotel, Boston. More information, (617) 432-1525.

Oct. 10-12

St. Luke's Hospital Department of Medical Education; Mid-America Cardiology Associates, "Workshop in Stress Echocardiography," Orlando, Fla. More information, (816) 932-2220.

Oct. 10-14

International Society for Heart Research, "14th World Congress on Heart Research," Kobe, Japan. More information, (813) 3586.8691.

Oct. 11-14

Mayo Clinic/Mayo Foundation, "7th Annual Symposium: Echocardiography in Congenital Heart Disease," Mayo Clinic, Rochester, Minn. More information, (507) 284-2509.

Oct. 11-15

American College of Rheumatology, "56th Annual Scientific Meeting," Georgia World Congress Center, Atlanta. More information, (404) 633-3777.

Oct. 11-16

American College of Surgeons, "78th Annual Clinical Conference," New Orleans Convention Center, New Orleans, La. More information, (312) 664-4050.

Oct. 12-14

Memorial Sloan-Kettering Cancer Center; European School of Oncology, "Nutrition and Cancer," Milan, Italy. More information, (212) 639-6754.

Oct. 12-15

American College of Cardiology, "Clinical Electrocardiography: Cardiovascular Board Review," University Place Executive Conference Center, Indianapolis. More information, (800) 257-4739.

Oct. 13-16

American College of Physicians, "Office Management of Common Medical Disorders," Guthrie Inn and Conference Center, Sayre, Pa. More information, (215) 351-2429.

Oct. 13-16

Northwestern University Medical School, "Echo Chicago '92," Northwestern University, Chicago. More information, (312) 503-8533.

Oct. 13-18

American Academy of Family Physicians, "1992 Annual Meeting: Issues in Geriatrics," San Diego Convention Center, San Diego. More information, (816) 333-9700.

Oct. 14-16

University of Wisconsin Office of CME, "Nuclear Cardiology Symposium," Marc Plaza Hotel, Madison, Wis. More information, (608) 263-2856.

Oct. 15

Deaconess-Central Medical Center, "Ethics in Caring II: Rationing of Health Care, Medical Goals in an Aging Society," Missouri Botanical Garden, St. Louis. More information, (314) 768-3006.

Oct. 15-18

American Institute of Medical Education, "Violence in America: Psychological and Sociological Perspectives," Omni Shoreham Hotel, Washington, D.C. More information, (800) 348-8441.

Oct. 15-18

American Society of Internal Medicine, "36th Annual Meeting of the American Society of Internal Medicine," Hilton Hawaiian Village, Honolulu. More information, (202) 289-1700, Ext. 615.

Oct. 15-18

University of Alabama at Birmingham Echocardiography Laboratory, "2D, Conventional, Color Doppler and Transesophageal Echocardiography," Callaway Gardens, Pine Mountain, Ga. More information, (205) 934-8256.

Oct. 15-18

UCLA Extension, "Office Gynecology: A Primer for the Primary Care Physician," Maui Intercontinental Resort, Maui, Hawaii. More information, (310) 206-8983.

Oct. 16-17

Institute for Medical Studies, "Cardiology Update: Clinically Oriented Review Plus Hands-On Workshops," Boston. More information, (800) 248-9955.

Oct. 19-22

Loma Linda University School of Medicine, "17th Annual Primary Care Update," San Bernardino Hilton, San Bernardino, Calif. More information, (714) 824-4963.

Oct. 21-23

University of Minnesota Medical School Office of CME, "Internal Medicine Review," Radisson Hotel Metrodome, Minneapolis. More information, (612) 626-7600.

Oct. 22-23

University of Tennessee College of Medicine, Chattanooga Unit, "Critical Care Medicine," Chattanooga Choo-Choo Holiday Inn, Chattanooga, Tenn. More information, (615) 778-6884.

Oct. 22-24

American College of Cardiology, "New Techniques and Concepts in Cardiology," Hyatt Regency Hotel, Washington, D.C. More information, (800) 257-4737.

Oct. 22-25

American Association of Cardiovascular & Pulmonary Rehabilitation, "1992 Annual Meeting," Hyatt Regency O'Hare, Rosemont, Ill. More information, (608) 831-6989.

Oct. 23-24

Institute for Medical Studies, "Cardiology Update: Clinically Oriented Review Plus Hands-On Workshops," Miami. More information, (800) 248-9955.

Oct. 25-28

Medical Group Management Association, "MGMA 66th Annual Conference," Marriott Orlando World

Center, Orlando, Fla. More information, (303) 799-1111.

Oct. 26-28

Mayo Clinic/Mayo Foundation, "Clinical Reviews," Mayo Clinic, Rochester, Minn. More information, (507) 284-2509.

Oct. 26-30

American College of Chest Physicians, "58th Annual Scientific Assembly: Cardiopulmonary Topics," Hyatt Regency Hotel, Chicago. More information, (708) 498-1400, Ext. 165.

Oct. 29-31

American Society of Bariatric Physicians, "42nd Annual Symposium on Obesity and Related Topics," Westin Hotel, Chicago. More information, (303) 779-4833.

Oct. 29-Nov. 1

Lloyd Noland Hospital, "Advances and Controversies in Internal Medicine Seminar," The Greenbrier, White Sulphur Springs, W.Va. More information, (205) 783-5276.

Oct. 30-31

Institute for Medical Studies, "Clinically Oriented Review Plus Hands-On Workshops," Phoenix, Ariz. More information, (800) 248-9955.

Oct. 30-Nov. 1

American Association for the Study of Headache, "Fall Postgraduate Course: Comprehensive Course in Mechanisms and Management of Headache," Stouffer Mayflower Hotel, Washington, D.C. More information, (609) 845-1720.

Oct. 31-Nov. 3

American Association for the Study of Liver Diseases, "Annual Meeting, Postgraduate Course: Hepatic Transplantation," Chicago Marriott, Chicago. More information, (609) 848-1000, Ext. 213. ■

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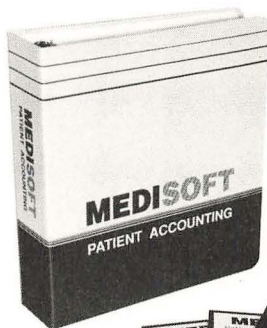
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Sol Tabachnick, Consultant



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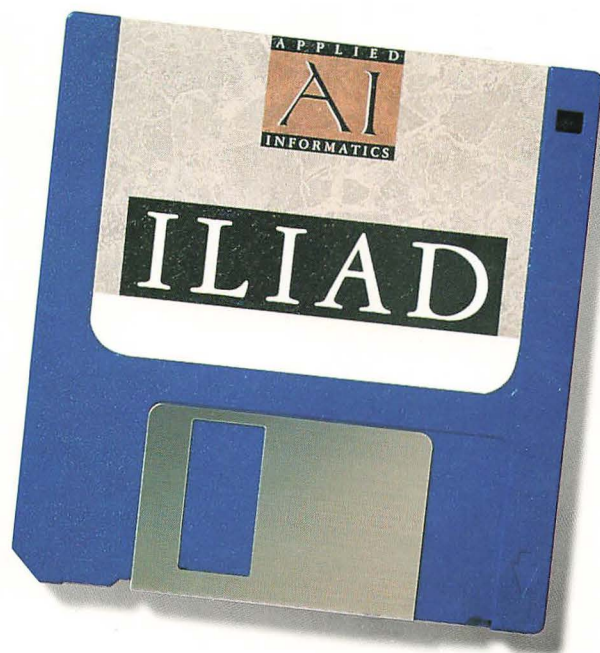
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Enter patient information and consult the data base for clinical information while Iliad provides a list of related key questions. Additional patient data can be entered, or changed and a list of possible diagnoses along with the likelihood of their presence can be consulted.

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